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atomic

Issue 68 | September 2006

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WINDOWS ON MAC

Cry for attention
or worthy
new platform?

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SANYO PROJECTOR

AMD AM2 MOTHERBOARDS

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board – Read
our roundup!

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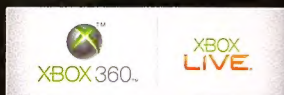
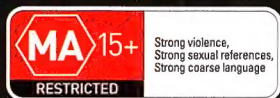
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* Disks available 1 August. Customers who pre-order prior to this date will receive their disk as soon as they become available. Subject to availability. Limited quantities available.



It's different here, dude



Welcome to California, the land of beaches, Hollywood and beautiful computer cases. Antec's world headquarters, senior management and design team are all right here, in the heart of California's Silicon Valley. The place where digital dreams turn to reality. We'd like to think that gives us a unique perspective that finds its way into all of our products and is why Antec stands out from the components crowd with market leading designs. Like NeoHE, our environmentally friendly power supply line or our path breaking QuietComputing™ cases, such as the world famous Sonata. So whether you want a computer that's totally gnarly or one that will just chill out, Antec is the word.

Antec
The Power of You

Saints Row

A promotional poster for the video game Saints Row. The title 'Saints Row' is at the top in a large, metallic, stylized font. Below it, four characters (three men and one woman) are standing in a city street at night, holding various firearms. The background features a city skyline with tall buildings and a bright, orange-yellow sky. The overall tone is gritty and action-oriented.

Sinners Welcome
coming soon

www.saintsrow.com www.truenextgen.com

Smashing

And smash we did. An FX-53 to be exact. In an attempt to come up with the cover to end all covers (or at least, a cover we could have a good laugh over two years from now in a non-descript pub 'round the back of Surry Hills), we took hammer to silicon and beat the living transistors out of a busted Athlon. As you can probably guess from the cover we have now, it didn't work out too well. That's probably because Nick, who works on our sister mag *PC Authority*, mashed the poor thing senseless. By the time he was done it looked more like a squashed Cadbury's Caramello... and definitely nothing like a \$1000+ processor.

Ah well, at least we got the laugh.

You're probably wondering right about now what to look forward to in the next 90 or so pages. Let me just say, there's *heaps*. Obviously, we've pitted the Core 2 against AMD's Athlon FX in a battle only the likes of Superman and Lex Luthor could rival. Then there's our AMD AM2 roundup – completely essential to those looking to step up to the latest and greatest platform. We tracked down the Crytek guys and tore apart *Crysis*, and somehow managed to get the creative dudes behind the next *Caesar* all in one room to chat about the game.

Hotbox of the Year 2006 is also here, and we have 12 of the best damn casemods the world has ever seen on display and, as a special treat, we have \$1150 worth of anime DVDs from Madman and a \$3299 projector to give away from Sanyo. Oh, and the \$1000 grand prize for Hotbox.

Part 4 of the Uber Linux tute also found its way into this issue, along with the last part of Ron's Lian-Li re-build. Finally, James Wang thought it'd be nice to see if a Mac with Windows on it was actually any good.

Yeah, *heaps* of stuff.



Logan Booker

lbooker@atomicmpc.com.au

Hotbox of the Year
\$1000 grand prize for the best of these world-class casemods!

10

AM2 for you!
Upgrading to AMD's latest platform? You'll need to see this roundup then!

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Prey day
Revolution in 3D shooters? We'll see.

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Crysis
Imagine what *Far Cry 2* would be like... whatever you're picturing, this is better.

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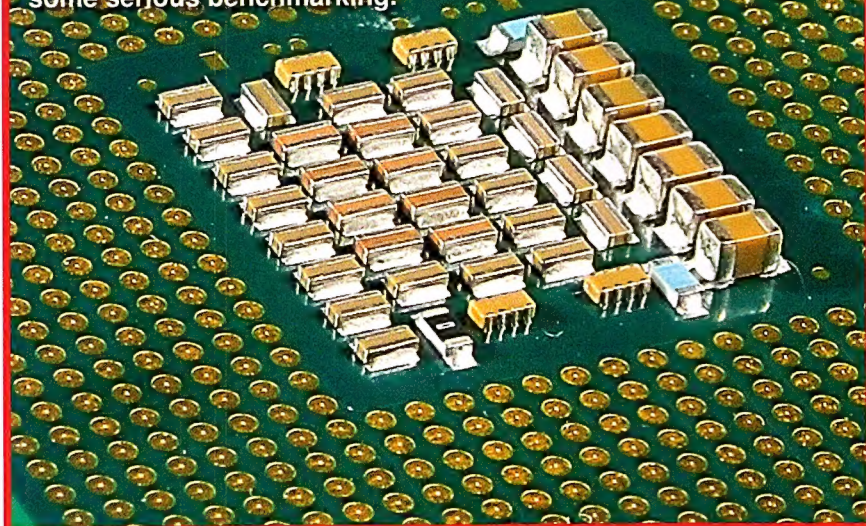
WANT TO WIN A SANYO PROJECTOR WORTH \$3299? SEE PAGE 50!

COVER STORY ▼

Intel vs AMD!

Looks like the Athlon might finally have a worthy competitor. Time to prepare for some serious benchmarking.

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this month

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Information, just the way you need it. Delectably digestible.

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Atomic does hardware like nobody else. Hot damn, that's sexy!

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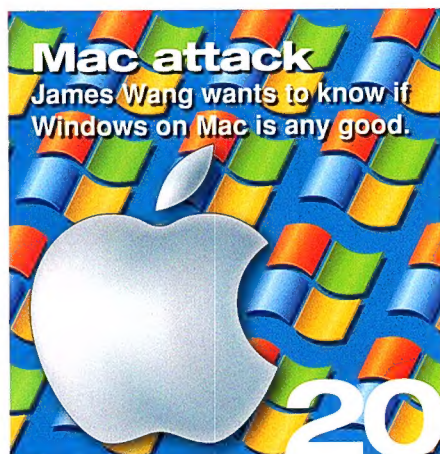
INTERACTIVE

Atomic is more than a mag, it's your mag. Join in with us here.

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Mac attack

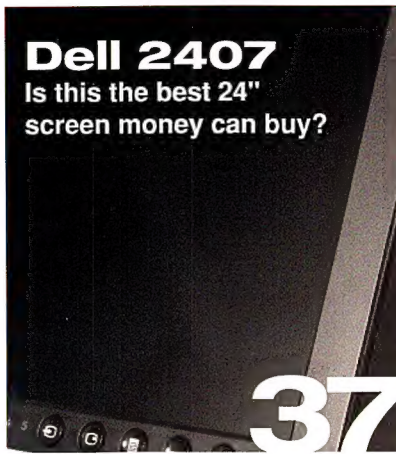
James Wang wants to know if Windows on Mac is any good.



20

Dell 2407

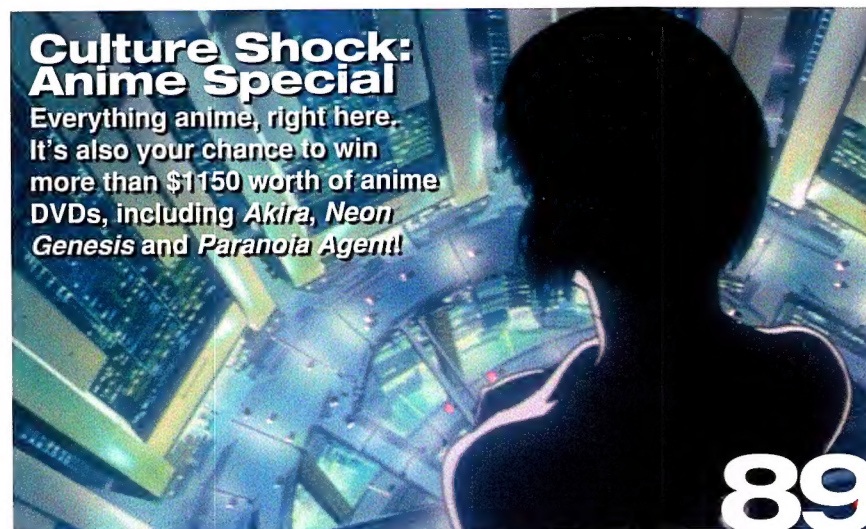
Is this the best 24" screen money can buy?



37

Culture Shock: Anime Special

Everything anime, right here. It's also your chance to win more than \$1150 worth of anime DVDs, including *Akira*, *Neon Genesis* and *Paranoia Agent*!



89

Continue

Validation Required

Microsoft untaps the wires

Ashton Mills wants that genuine advantage.

Microsoft's Windows Genuine Advantage (WGA) tool, which received an update earlier this year to help detect pirated versions of Windows, has taken a step back due to perceived flak over the functionality of the application.

Originally an optional install, WGA has since become a requirement in order to download updates and add-ons to the Windows operating system from Microsoft's update service. Helping distribution of the tool, WGA itself is installed automatically for those with 'Automatic Updates' enabled.

In April this year, new features were enabled

through the installation of the WGA Notifications component complementing the already present WGA Validations component. Together they report on whether its host is a valid copy of Windows, even going as far as to inform the user if they weren't using a legitimate copy and restricting access to updates. For Microsoft, checking legitimacy involved the validation of Windows and the pinging of Microsoft servers at every boot.

Not only did this quickly earn the software a 'spyware' moniker, but the tool itself was found to be fallible, and told legit users that their Windows was pirated. Its covert installation also

led to a lawsuit against the company in the US.

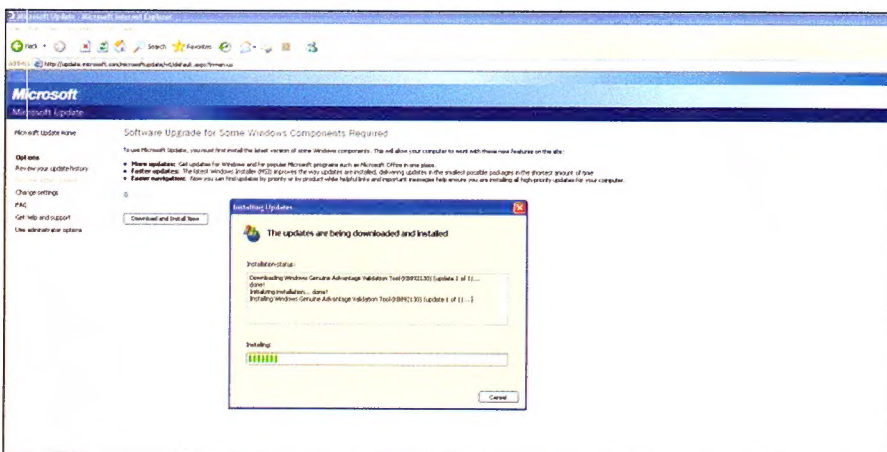
WGA also has implications for the corporate market, where volume licensing (multiple machines using a single licence) is now seen as one seed of the piracy problem, with 'escaped' licences enabling illegal copies of Windows to be installed and used. Going forward Microsoft hopes to be able to validate each Windows Vista seat individually, and will need a validation and reporting tool to do so.

The backlash, understandably, was larger than Bill's belly after a gratuitous yum cha.

Responding to criticism Microsoft has since published that updates to WGA will now only check validation once a month, instead of once a day, and that the Notifications component will no longer contact Microsoft servers. This hasn't stopped various how-to guides popping up on the Web on how to forcibly remove the software. And the recent discovery of the Cuebot-K worm found posing as 'Windows Genuine Advantage Validation Notification' certainly hasn't helped.

Regardless of the back down WGA is a sample of what we can expect with Vista. Microsoft is ensuring only validated copies of the operating system get to use some of its more potent features, like the graphics accelerated Aero interface, in an attempt to discourage pirated copies.

Ironically, WGA and validation is required to download Microsoft's own anti-spyware tool, Windows Defender.



▲ WGA: for the love of all that's holy and good on this planet, don't install it!



Removable storage

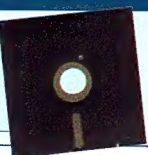
Floppies, Sneaker Net, Zip disks — where would we be without our faithful removables? From 80KB to 50GB, they've changed the world. Even the sizes of your drive bays are named after these humble, often fragile, heroes!



5.25" floppy (360KB) The first double density double-sided 5.25" floppies could hold a gargantuan 360KB, and are the first disks most geeks associate with 'floppies'. They drove many a Commodore 64 and 128 in the humble 1541 drive at the time. *Lost factor:* Almost 1000, 5.25" disks would be required to store a single episode.

1969

8" disk (80KB) The world's first production floppy was courtesy of IBM as a means to cheaply distribute updates for its System/370 mainframe customers. *Lost factor:* It would take 4500, 8" disks to store a single XviD encoded episode of *Lost*.

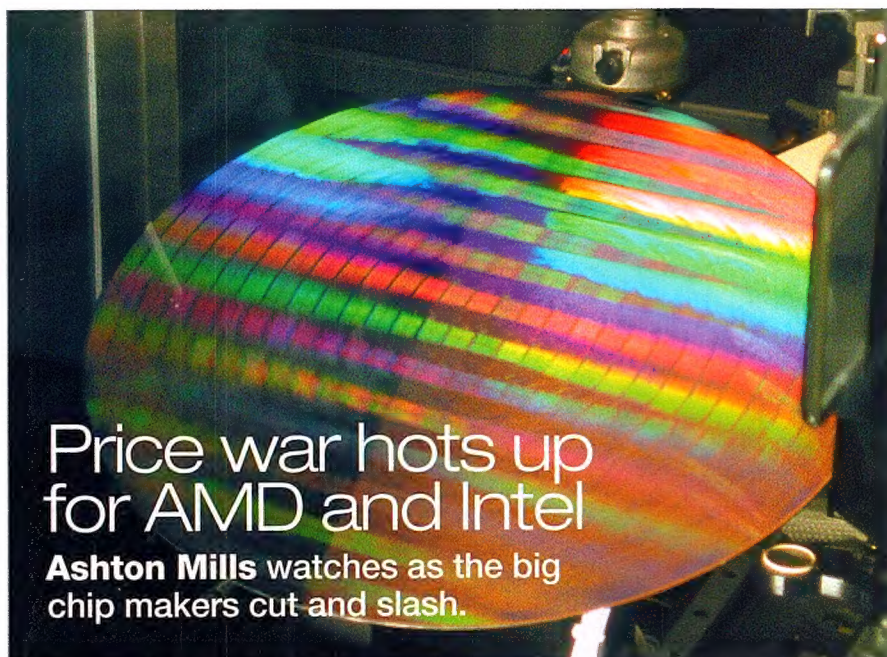


1978

1982

3.5" floppy (1.44MB) The '80s saw 360KB 3.5" disks. They evolved to 720KB and later 1.44MB per disk, though the use of 1337 tools like *fdformat* got this to 1.7MB per disk. Commonly associated with the term 'Sneaker Net'. *Lost factor:* 250 floppies for a single episode of *Lost*!





Price war hots up for AMD and Intel

Ashton Mills watches as the big chip makers cut and slash.

It's a good time to be a consumer, with price cuts on both AMD and Intel CPUs by the time you read this and more on the way.

Intel, with its official release of Conroe, is discounting prices on previous generation CPUs from Pentium 4s to Pentium D 960s by as much as 60 percent, in a bid to make way for its next-generation platform. Even recent dual-core processors could see as much as a 15 percent reduction.

Not surprisingly, it's also a competitive move to try and regain lost market share from AMD, which raised its share of the CPU market to 20 percent last year for the first time in four years. Additionally, with recent moves like that of Dell finally opening up to AMD's processors, have put pressure on Intel to stop the fall in its share price.

Traditionally AMD has been able to play on value with competitive pricing for its products, but with Intel's planned price cuts and the official launch of Conroe, AMD needs to respond or risk losing the ground it has gained.

As a result AMD is fighting back with reductions

of its own, with cuts on its single and dual-core lines of up to 50 percent in place by the time you read this. Even the lower-end Sempron range will see savings of as much as 15 percent, making the affordable chips even more affordable.

“When it comes to price wars, consumers benefit the most.”

As part of its strategy AMD is planning to release its low-end Athlon 64 X2 3600+ AM2 chip, previously slated for the end of the year, earlier and priced competitively below Intel's Pentium D range. The hurt is definitely on.

Both companies will have delivered their second quarter fiscal reports by the time you read this, revealing just how competitive the price war will need to become.

As always there are a number of factors at play.

While both companies can no longer rely on the release of Vista this year to boost their sales, ASUS, just one of many large motherboard manufacturers, is expecting to ship 60 million motherboards this year, up 8 million from last year, showing that there's still growth in the market yet.

Fortunately when it comes to price wars, it's consumers who benefit the most.

short circuits

Cow power! It's great!



Your home could be powered by the essence of cow – if you're lucky enough to live in Vermont, US. Although it costs more to run on 'Cow Power', about US4c extra per kilowatt hour, you'll be able to sleep knowing there's a pile of manure in a farm somewhere being converted into natural gas and burnt, all so you can enjoy environmentally-friendly electricity.

Looks like Vista will replace the standard file and driver install model we know and love with an image-based alternative.

Yeap, when you get your copy of Vista, it'll be dumping an image of the OS onto your PC that will adapt to your hardware. Can we look forward to super-quick re-installs? Here's hoping.

GDDR3? Who cares when Samsung has started throwing GDDR4 into the fray! According to sources, the new 512-bit RAM will be one third faster than GDDR3, with 2.4Gb/s of bandwidth at its disposal. Smarter engineering it may be, but our bets are that the 80nm process has something to do with it too.

How long will we be waiting for computers with flash instead of magnetic drives? Not long at all considering Sony has just released a laptop, the Vaio UX90, sporting a 16GB flash 'hard drive'. Now, 16GB is nothing in this day and age, but when you think about the read/write speeds, it's not really an issue. Unless you do a lot of reading and writing, in which case you'll probably kill the thing in a matter of months.



Zip drive (100MB to 2GB) Iomega tried to re-invent the floppy in '94 and brought us the Zip drive. Storing 100MB at first, then later 250MB, and at a time before CD-RW. The company later had removable 'hard drives' in its Jaz lineup, providing removable read-writeable disks up to 2GB in size. *Lost factor:* Four Zip disks for one episode... or five episodes on one Jaz.



HD-DVD/Blu-ray (15GB to 25GB) HD DVD-R and HD DVD-RW drives and discs are anticipated for the end of this year, with Blu-ray not far behind. Both formats support dual-layer, bringing capacities to 30GB and 50GB respectively! *Lost factor:* One disc for an entire season... or three... no probs.

1998-1997 1994

CD-R/CD-RW (650MB) Although CD-ROMs first appeared in 1985, writeable CD-R didn't appear until '88, and read-writeables until '97. Their volume blew all removable storage media out of the water. Except for the Jaz disks (see next). *Lost factor:* If you fudged it, two episodes per disk.



2001

DVD-R/RW (4.7GB) DVD-ROM hit the world in '96 but it would be five years before consumers could burn their own with DVD-R and DVD-RW discs. The 4.7GB capacity was a huge leap from anything before it for removable media. And double layered disks extended this to 8.5GB. *Lost factor:* You can back up half a season, or 13 episodes, per disk.

2006

HOTBOX OF THE YEAR

More than \$1000 worth of PC bits for the best of the best hotboxes!

Can you believe it? We've had 12 months of fantastic modded cases, or hotboxes as we like to call them, at Atomic HQ since last Hotbox of the Year, and now it's time to see which of these new boxes is the king.

As you are no doubt already aware, each month we run a competition to see which reader-submitted case is the best out of three or four finalists. The winner, along with fame and acclaim, receives a motherboard, the most recent being supplied by the awesome folk at Gigabyte. And, because Gigabyte love you guys, and Atomic, it has decide to supply a great prize bundle for our Hotbox of the Year 2006 winner.

To the left you'll see more than \$1000 worth of PC gear, and all of it is going to the best hotbox of the last 12 months. You're probably wondering who decides which case is the greatest... Well, stop wondering because we can tell you right now that it's *you guys*. Yes, just visit www.atomicmpc.com.au/hotboty.asp and submit your vote. It's as easy as that!

Don't wait, go vote! And enjoy the splendour of the best casemods the mod gods have to offer.

HERE'S THE BUNDLE

Over \$1000 worth of PC gear!

Gigabyte nForce 590 SLI motherboard

The latest AM2 platform mobo from Gigabyte featuring NVIDIA's screamingly hot nForce 590 SLI chipset.

Gigabyte GeForce 7900GT 256MB video card

The ever-sexy 7900GT chip from NVIDIA, combined with 256MB RAM to clobber all your gaming needs.

Gigabyte 3D Aurora case

A stylish, well-designed case from Gigabyte to store all your new parts.

Gigabyte 3D Rocket II cooler

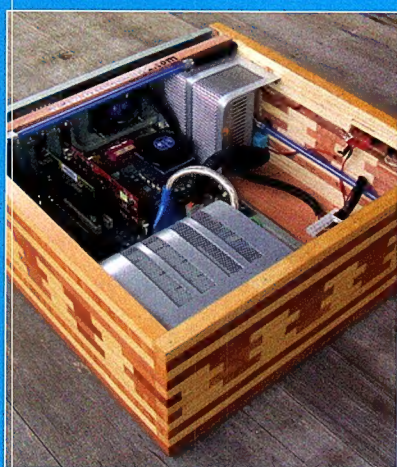
One of the best coolers on the market, courtesy of Gigabyte, to keep your CPU nice and stable.

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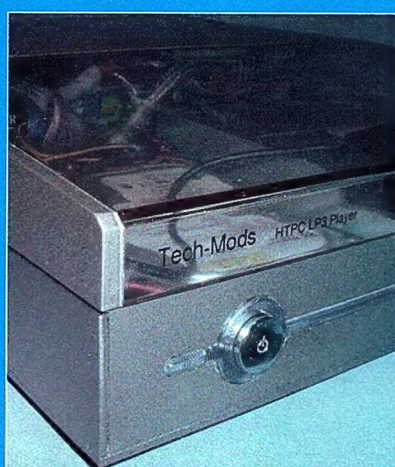
GIGABYTE
TECHNOLOGY



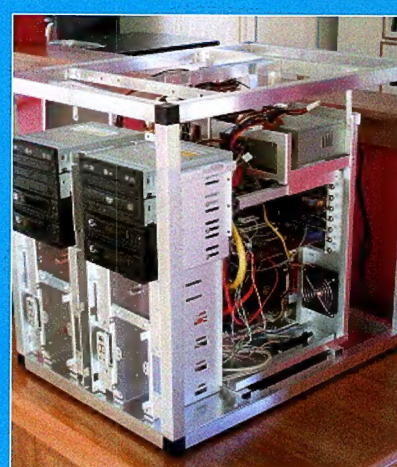
TO CAST YOUR VOTE FOR ATOMIC HOTBOX OF THE YEAR 2006, GO TO
WWW.ATOMICMPC.COM.AU/HOTBOTY.ASP



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MAKER **MAD**
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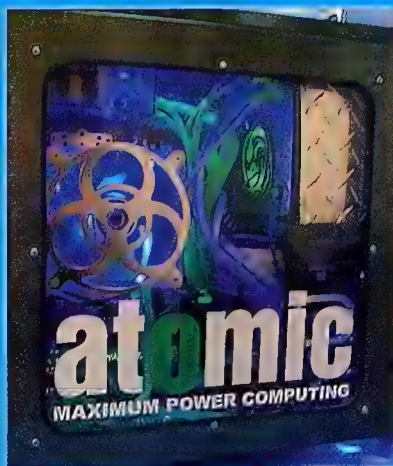
NAME **HTPC LP3 PLAYER**
MAKER **TONY**
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NAME **DUAL-DESK PCs**
MAKER **ATTILA**
ISSUE **#59 DEC 05**



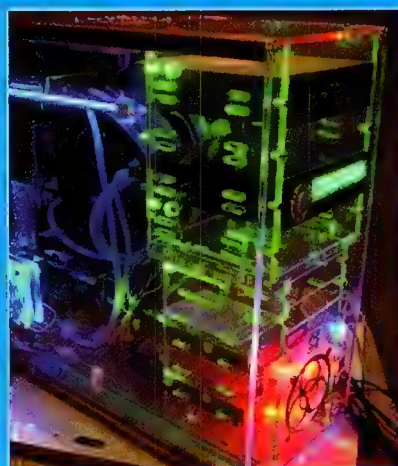
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MAKER **MATTHEW**
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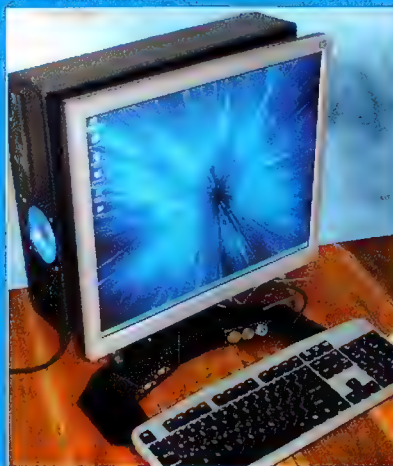
NAME **BOXEN**
MAKER **HAZZA**
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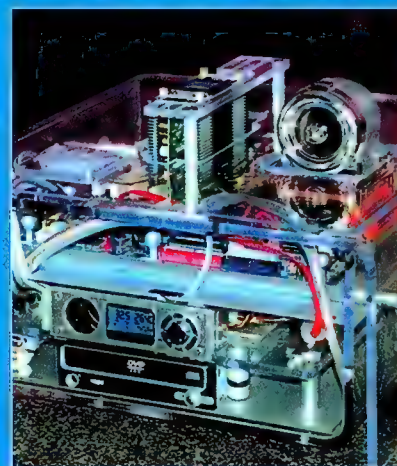
NAME **TONKPUTER**
MAKER **NEV@LEHMA**
ISSUE #62 MAR 06



NAME **TECH BITCH'N CASE**
MAKER **SEPPY STEVE**
ISSUE #63 APR 06



NAME **BLACK BOX**
MAKER **ANDREW**
ISSUE #64 MAY 06



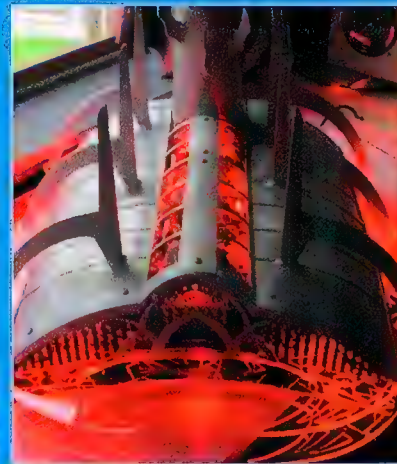
NAME **HOTROD**
MAKER **RUSSELL**
ISSUE #65 JUN 06



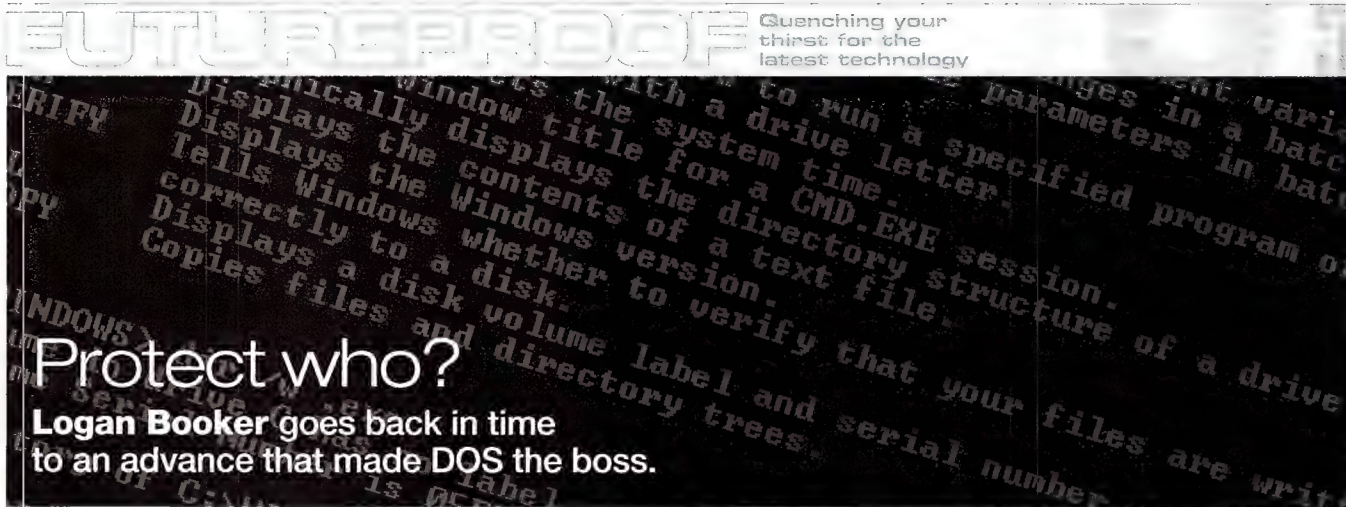
NAME **PORTABLE PC**
MAKER **PHIL**
ISSUE #66 JUL 06



NAME **R2-D2**
MAKER **KEN**
ISSUE #67 AUG 06



NAME **TEMPLE OF NOD**
MAKER **EDVULD**
ISSUE #68 SEP 06



Protect who?

Logan Booker goes back in time to an advance that made DOS the boss.

As a change of pace, we're going to take a look at one of the pivotal developments in processor history – the introduction of protected mode (p-mode).

Protected mode was a feature integrated into the 80286 series of Intel CPUs back in 1982 and allowed programmers to access memory above the 1024KB limit. So you could say it future-proofed the CPU – something it continues to do with modern operating systems.

To understand all the advantages p-mode brought about, we first have to look at real mode. Real mode didn't actually exist until p-mode was created, as real mode was the only mode a CPU could operate in. It consisted of a 20-bit memory address space that granted access to just 1MB of memory ($2^{20} = 1,048,576$). While this was more than enough with the introduction of the original 8086 CPU, by the time we got to the 80286 it had become a barrier.

Before p-mode, one solution was to allow programs to use all the 1MB address space. Although the processor had access to the entire 1MB, only 640KB was available for application use, the other 384KB reserved for peripheral communication. By using an add-in board or

a software driver (such as EMM386) one could utilise 64KB 'frames' of this reserved memory.

Software, however, demanded more space in which to store data, and even with expanded

operating in protected mode could not run real mode programs. Switching between modes was precarious at best; a minefield of crashes for coders.

Enter the 386 with 32-bit protected mode. Upping addressable memory to 4GB and updating pretty much everything to 32-bit, p-mode was finally a great place to develop software. Support for protected mode came in a number of forms, the most important being the DOS extender. DOS extenders basically emulated a real mode environment while running in protected mode, allowing programs to not only address loads of memory, but do something useful with it as well. Also introduced by 32-bit protected mode was memory paging, allowing multiple programs to be in memory at once and opening the doors to multitasking.

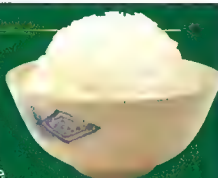
These days, real mode doesn't see much use – most modern operating systems switch to, and stay in protected mode as soon as they start. That doesn't mean that support isn't there – Athlon 64s and even the latest Core 2 Duos can run DOS in real mode if you really want them to.

The question now is, how long will processors have to maintain this backward-compatibility?

memory there was still the 1MB limitation. The first type of protected mode supported by the 80286 was 16-bit, and allowed addressing of up to 16MB of memory. However, the access to additional memory came at a cost – a CPU

FACTOMATIC

- Rice is a type of grass.
- The word 'salary' is derived from 'salt', as it was used in ancient Rome as currency.
- The most powerful laser in the world, the Petawatt, is based at the Lawrence Livermore National Laboratory in the US and has a peak output of 1.25PW (1,250,000,000,000,000 watts). It is primarily used to simulate the power of the sun.
- Gold, although more corrosion-resistant, is not as electrically conductive as silver. Silver was also once used as an antibiotic before the widespread use of modern medications.
- Gunpowder was discovered accidentally during the search for an elixir of life, according to Chinese history.
- You can blame Scotland for the invention of golf.
- LED (Light Emitting Diodes) are made from a range of materials, including diamond, sapphire and gallium. Diamond LEDs produce UV light, sapphire blue and gallium-based LEDs are usually green or red.



BIOTECH JUSTIN FRANKEL

From Winamp to Gnutella to WASTE.

Justin never finished university, a course in Computer Science left to rot after just two quarters. It was 1996 and the Internet and the MP3 revolution was starting to gain momentum. With time to burn, Justin came up with Winamp and, under the company name of Nullsoft, he released the software MP3 player to the masses. It didn't take long for the money to come in and by 1998 Justin was rolling in it. When AOL eventually bought Winamp and Nullsoft for a cool US\$89 million, Justin was a multi-millionaire at the tender age of 21.

Sadly, AOL wasn't exactly interested in anything else Justin had to offer and, after running afoul with the company on a number of occasions, he bailed in 2003. Currently he spends much of his time doing nothing really, but has dedicated some effort to working on a multitrack audio editor called REAPER: www.cockos.com/reaper
Source: www.wikipedia.com



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**Sound
BLASTER**

X-Fi

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The waiting game

Why play a game as soon as it comes out if it's 10 times better a few months down the track?

Tim Dean thinks it's time to exercise some patience.

If you read my column last month you would have seen a pitiful account of sorrowful man (me) in the middle of an MMO launch gone bad. Well, that's not really the end of the story.

Remember that episode of *The Simpsons* in which Homer and Marge go to the all-you-can-eat seafood restaurant? Remember how when Homer was booted out for eating too much, he was so unsatisfied that he and Marge went fishing? Well, that's pretty much what I did after my horrific experience with the launch of Seed.

I desperately needed MMO closure, which ultimately meant I needed another game to satiate that deep and abiding need for something that was online, and that was not Oblivion. So in desperation I turned to the first MMO I could find, which in this case happened to be EVE Online. Not only had I heard good things about it, but I could download it and play it in one smooth action, without even needing to get out of my seat.

What I found in EVE was fascinating. I won't go into detail on my experiences in EVE itself – like about how beautiful the game looked, and how deep the game mechanics were, or about how little there was to actually do in the game, or how long every damn thing took – but the experience did leave a striking impact that was quite separate from the gameplay itself.

By gum, I thought, this is what it's like to play a polished game. It wasn't the perfect fit for my personal gaming needs at the time, but it was unapologetically targeting a particular kind of gameplay, and it had refined that model to a startling degree. It couldn't have been more different to the disastrous Seed launch I had just suffered through.

However, the positive EVE experience was about to be confirmed by another that was uncannily similar. Because EVE really wasn't my cup of tea, I decided to experiment again and try another MMO I'd heard a lot about: City of Heroes. Now, CoH had been out for more than a year by the time I got around to installing it (and its brethren City of Villains), and a couple of days inside showed the results of that fact to ample effect.

CoH, and to an even greater degree CoV, were polished, mature games. Not only were they not buggy, but they had many months of active play with hundreds of thousands of gamers stressing the system to its limits giving feedback and suggestions to improve it.

Furthermore, the forums were filled with

pages and pages of sage advice and helpful gameplay tips. All of these things made CoH thoroughly entertaining for me.

This got me to reflecting. I normally play games as soon as they come out. I'd never really thought of doing it any other way. But now I'm starting to believe there's a very different way to approach gaming.

It's called waiting.

My experiences with the MMOs even got me thinking about other offline games I've played recently. For example, in retrospect, I should never have even touched Oblivion until BTmod had been released. Galactic Civilizations 2 has also benefited from several months of refinement since it came out.

And what about future games? I'm looking forward to the Conan MMO, mainly because I've long enjoyed Robert E. Howard's pulp fiction, but I think that one could certainly do with a few months of settling time. As has Dungeons and Dragons Online. I'm very

glad I didn't dive into that on day one.

Let's hope this new 'patience' thing holds up. It might even save me from another Seed experience. One can only hope.

Tim will also be shunning Spider Solitaire and Minesweeper in favour of Patience in the future.
tim@atomicmpc.com.au

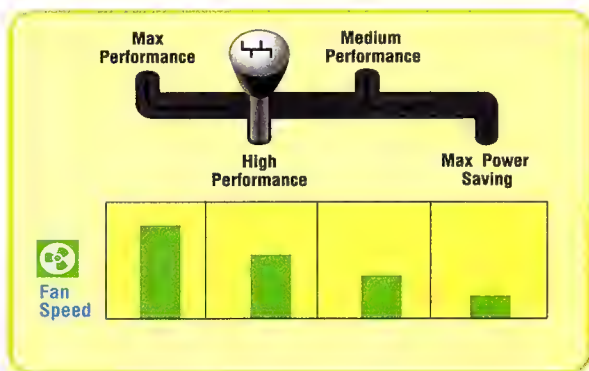


Adjust Computing Speed as you wish

In accordance to the release of the Intel P965 chipset, ASUS recently launched the P5B Series. The two new boards come equipped with 3 unique tools - AI NOS™, AI Gear and AI Nap - that enable precise PC performance control during various applications. Today, let us walk you through these new solutions.

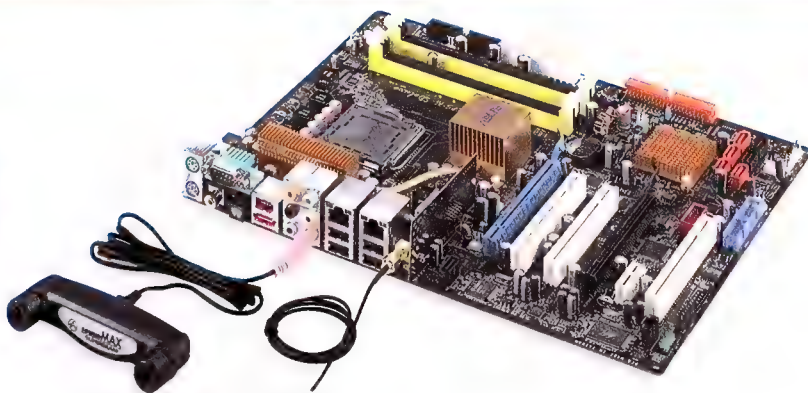
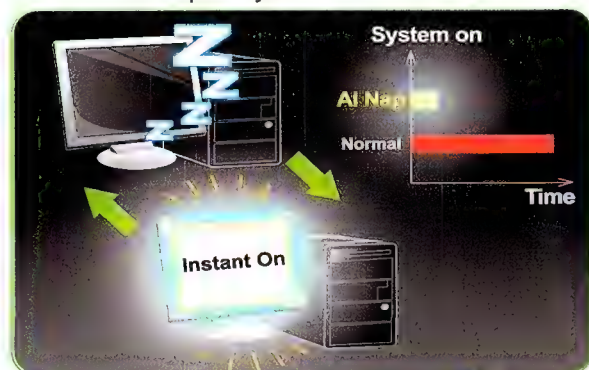
■ AI Gear - Minimum Noise

To balance system performance and silent computing, **AI Gear** enables users to choose from profiles to adjust CPU frequency and vCore voltage, minimizing system noise and power consumption. It takes careful fine tuning of various settings to get the most out of a high-performance system.



■ AI Nap - Maximum Power Saving

AI Nap lets users "relax" their PCs without terminating current tasks. System will continue to operate at minimum power and noise when users are temporarily away. It downloads files and runs applications at the quietest state while users are asleep. Simply click on the mouse to wake up the system in seconds.



■ AI NOS™ - Extreme Performance

AI NOS™ or Non-delay Overclocking System detects system load, and automatically boosts performance for the most demanding tasks. Compared to other performance tuning technologies that monitor system temperature (temperature rise usually comes minutes after system load increase), **AI NOS™** delivers performance hike when users need it to most.

■ Intel P965 chipsets and Intel Core2 processor support

The P5B series motherboards are based on the Intel P965, the latest chipset designed to support a maximum 8GB dual-channel DDR2 800/667/533 architecture and multi-core CPU. The P965 chipset includes Intel Fast Memory Access technology that significantly optimizes the use of available memory bandwidth and reduces the latency of the memory accesses. The P5B Deluxe is ready for the next generation Intel Core2 processors in LGA775 package. With the new Intel Core microarchitecture technology and 1066/800MHz FSB, the Intel Core2 processor is one of the most powerful and energy efficient CPU and shows incredible performance when partnered with the P5B series motherboards.

To bring out the very best of the P965 chipset and Core2 processor, the ASUS P5B Series is an excellent choice. Attached are the boards' basic specs. We strongly recommend these new ASUS boards.

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- Intel P965 with Intel Fast Memory Access Technology
- Intel ICH8R with SATA RAID 0,1,5,10 support
- 1066 / 800 / 533 MHz Front Side Bus
- 4 x DIMMs, max. 8GB, Dual Channel DDR2 800 / 667 / 533 MHz, non-ECC, un-buffered memory
- 2 x PCI-E x16 (the blue one @ x16 mode, the black one @ x2 or x4 mode)
- Dual Gigabit LAN
- 8 x Serial ATA 3.0 Gb/s ports including 1 external port

P5B

- LGA775 socket for Intel Core Extreme / Core2 Duo / Pentium Extreme / Pentium D / Pentium 4 / Celeron D Processors
- Intel P965 / ICH8 with Intel Fast Memory Access Technology
- 1066 / 800 / 533 MHz Front Side Bus
- 4 x DIMMs, max. 8GB, Dual Channel DDR2 800 / 667 / 533 MHz, non-ECC, un-buffered memory
- 1 x PCI-E x16
- Gigabit LAN
- 6 x Serial ATA 3.0 Gb/s ports including 1 external port

Round the table with Caesar IV

Logan Booker sits with Tilted Mill's Chris Beatrice, Tony Leier and Mat Williams to discuss the future of the city-building genre.

City-building is coming back in a big way – and not the kind that has you picketing outside your local council, screaming random profanities as members of parliament. If you're not familiar with city-builders, think SimCity. You get some cash, a bit of control and the power to build your own living city. There's no direct influence (other than place buildings) – everything is managed by altering subtleties and watching the flow-on effects. It's up to you to construct intelligently so your fledgling city can prosper. Forget combat or blowing stuff up, city-building is all about leadership and wisdom.

No one did city-building like Impressions, the developer who you could say produced the best titles of the genre. To this day, its Caesar series is known as the greatest example of the genre. While Impressions is no more, many of the developers from the company now work at Tilted Mill, doing what they do best. We thought it a great idea to quiz these guys on the genre's comeback, as well as the next instalment in the Caesar series.

atomic How long has Tilted Mill been around and how many people from Impressions reside there now?

Chris Beatrice I almost can't believe it but we are coming up on our 5th anniversary! In the early days at Impressions we would develop and publish six or eight games *per year*. Now it's about two years per game.

As for former Impressions employees here at the Mill, there are quite a few... let's see, in no particular order (just going around the office in my mind), Greg Sheppard, David Beebe, Mat Williams, Tony Leier, Tony Hosier, Jeremiah Freyholtz, Keith Zizza, Mike Malone, Adam Carriuolo, Mike Gingerich, Jim Solomon, Dean Lawson, Chris Harvey, Blair Evans, Jeff Fiske, Peter Haffenreffer, Hans Schroder, Lenny Eusebi, Dennis Rose, and me – that's 20!

atomic What do you believe are the most important ingredients in a good city builder?

Tony Leier A lot of the fun of a building game is creating the city that you want. So, we make a game with a lot of things you can do and a lot of things that are happening, and give you some overall high level goals. We make sure there are many, many different ways to build a successful city. Having that room to be creative and personalise what you're doing is one of the most important things in a building game.

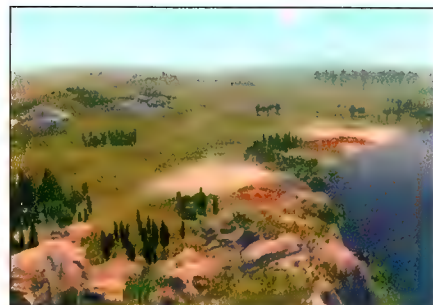
The other half of that is to make sure the creation process is fun. There's an immense amount of work that goes into that in every part of the game.

atomic Where do most of the problems crop up in a city builder? The AI or perhaps the interface?

Chris Beatrice The thing about city building games is that what you are creating is essentially a single, almost living being. As such, during design and development, it is very difficult to get a sense of what the actual gameplay is like, unless all systems are in place and working well. Similarly, if something breaks during development (which is a natural, and continual occurrence), often the entire game becomes nearly unplayable. This means that as designers we need to be able to design and envision the entire experience in our heads. We need to see the end goal even though the developing game may be very far off from that, in the early stages. One thing we experience while developing these games is that as playtesters and other team members are playing the partially complete game, they instinctively come up with 'solutions' and suggestions to address problems or lacking functionality in the game, not knowing, or I should say not being able to see clearly that these things have already been accounted for, and that they just need to be patient. Of course we respond to new ideas during development, but with these games you need to keep a pretty tight hold on the target functionality, or you will find the whole thing unravelling. This is one thing Tony Leier is really good about. Often players will



Caesar IV promises high-end users amazing panoramas with a dynamic day and night cycle, soft shadows and all the latest shader effects, above and right.





There are many different ways to build a successful city, above and below, but we're betting that tiled roofs, arches and circular arenas feature prominently.

feel the game is imbalanced, or in need of some drastic change, when in fact it's just that one small, though crucial system has not been put in place yet.

Tony Leier: A city builder has a huge amount of interconnected systems and feedback. They are very complex systems. So, it's a big challenge for us to make sure this complexity is communicated well. And we have to make sure the overall system comes together in the gameplay and fun that we want. And we have to make sure one part of the complex system doesn't break a different part of the system. Figuring out just what part of the system isn't working right is sometimes an adventure all of its own.

atomic What was the motivation for creating a new Caesar? Do you think there's enough interest in the city-building genre to justify a fourth game?

Chris Beatrice Yes, in fact, it seems that 'life sim' games are becoming more and more popular, and the Caesar series has always occupied a unique spot somewhere between those and historical strategy games. The Caesar 'formula' has never been matched, though there are a few clones and would-be challengers out there. It's hard to believe that it'll have been eight years since the last Caesar game, and from the response we've gotten from fans and journalists, I can certainly say there is enough interest out there. The challenge is to bring the Caesar experience to a wider audience, and to do it all in 3D.

As for motivation, well, I guess it was sort of a 'perfect storm'. More than half of the team members at Tilted Mill are from Impressions, and many played key roles on Pharaoh, Zeus, Caesar III and even Caesar II, so we were always very eager to keep working on the Caesar games. Similarly, Vivendi was keen to continue developing the franchise, and so there you go. Usually, as a developer, you find yourself having to work extraordinarily hard to convince

a publisher to consider your game idea, but in this case Vivendi was pretty much committed to taking the series to the next level, and we were really happy to partner with them again.

atomic Did you have any specific design goals when creating Caesar IV? Can you give us an example of something you've learned from previous games that you've been able to apply to Caesar?

Chris Beatrice Really we needed to accomplish two important things: maintain what it is that makes the Caesar games so special, while at the same time open up that experience to more players. In some ways these are, or could become, contradictory goals. The Caesar games have always delivered a nice mix of in-depth strategy gameplay, with a light, humorous, lively presentation, and ease of use. Caesar is a creative game, not a combat game. These types of combinations are rare in good games, and not always easy to deliver.



ATOMICBIO

Website: www.tiltedmill.com

Name Chris Beatrice
Occupation Lead designer, Caesar IV;
President of Tilted Mill

Chris is 'the man' at Tilted Mill, having founded the company in 2001 after Impressions broke up. He made his way into the games industry in 1993 as an artist, and it didn't take long for him to find himself as art director at Impressions. The catalyst for Chris' career in design came in the form of Impressions' Lords of Magic, but it wasn't until the extremely successful Pharaoh that he had a chance to do the entire design thing solo. Chris believes his background in fine art adds a unique perspective and flavour to the creative process – a fact evident in many of his titles. Right now, he's president and lead designer on Caesar IV.



Name Tony Leier
Occupation Senior designer, Caesar IV

With a degree or two in mechanical engineering, Tony is pretty darn smart. When he decided that making computer games sounded like a really great idea, he joined up with Impressions and churned out more than a few titles including Caesar III, Zeus and Pharaoh using his engineering experience and knowledge to add that extra edge to development. At the moment he does a lot of senior designing for Caesar IV.



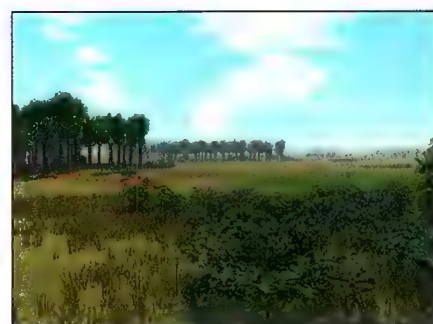
Name Mat Williams
Occupation Producer, Caesar IV

Mat's relationship with Impressions and eventually Tilted Mill started way back in 1997 when he playtested two of the former company's titles, Civil War Generals 2 and Lords of Magic. After running his own development studio Zero Sum Software for a few years (cranking out the RPG Prelude to Darkness) he joined Impressions, and then Tilted, and has been there ever since. Currently he's doing the whole producer thing on Caesar IV.





In Caesar IV, homeowners will have to walk to the markets themselves, above, if they plan to make use of the picnic grounds, above right, that you may provide.



In Caesar there are gameplay challenges and pushbacks, but really the reward comes from creativity and building. Most games are one or the other – either strategy games where you don't care about your 'units' or don't feel you are creating something, or creative playthings with no real strategic challenges, or even a sense of victory.

Caesar is a game where there is a lot going on, and ideally you, the player, should be able to tell exactly what's happening just by looking at the city, and maybe using some special display modes. These types of games are deceptively difficult to make, and to balance properly. For example, it's hard to show a 'narrow slice' of gameplay – the gameplay doesn't emerge until almost all systems are working, because Caesar is about creating an organic whole – a living thing – not a three-second adrenaline rush.

So in a nutshell we had to preserve all the basic player activities that characterise the series, even to the point of ensuring that strategies and approaches to city-building that worked in prior Caesar games also work in Caesar IV. It's no good when a long time fan, an expert Caesar player sits down to play and finds he is no longer a good player, because the designers decided to 'shake things up a bit.' However, in order to make these systems more accessible, smoother, and more 'user friendly,' they needed to be completely re-invented from the bottom up. For example, there are no 'access walkers' in Caesar IV, and rather than a randomly wandering market lady delivering food and goods to houses, homeowners determine what they want, and go and retrieve these things themselves (in fact, all resource transportation works this way).

atomic What can you tell us about the engine you've created for the game? What did it need to do well?

Mat Williams There were a lot of challenges we had to overcome with the game engine. Most graphic systems are optimised and structured for first person shooter viewpoints – highly detailed close-ups, relatively static environments. A city builder needs the opposite of that – thousands of unique and dynamic objects on screen at once. Furthermore most of these are laid out by the player which makes pre-processing very difficult. We also felt from the beginning that it was very important to allow players to be as free as possible with their view. We don't restrict camera angles and allow as much of a bird's eye view of a city as possible while still keeping up the detail for the close-in views of the city streets. For high-end users the panoramas that they can see are amazing with a dynamic day and night cycle, soft shadows and all the latest shader effects. For low end users they can make the choice between some restrictions on camera angles or some loss of visuals, like removing shadows.

atomic Do you believe there's an opportunity for multiplayer in a city builder like Caesar? If so, how would it work?

Tony Leier I've thought about that many times, and haven't found much of an opportunity for multiplayer in a building game. The thing that makes multiplayer fun is competition, whether it

against other people or against an AI opponent. A building game like Caesar IV doesn't have enough head to head competition to make multiplayer all that interesting. It'd be like two people trying to build something with the same Lego on the same small table. Sure, you can do that, but it's almost universally more fun for each person to have his own set of Lego and his own table to play on.

atomic What other projects would you like to see Tilted Mill work on in the future? Real time strategy perhaps?

Chris Beatrice One thing I *don't* think we'll get into is combat RTS. For one thing, there are a lot of great developers out there already doing a great job with that genre. For another, in the past few years we've seen more and more interest in creative games, life sims, and building

games, which is where our expertise really lies (and few developers really know how to make these kinds of games). We are likely to explore different ideas that incorporate building sim-type gameplay into other milieus, or which bring other game dynamics and settings into the city building genre.

atomic What do you believe is the next step for the city building genre? Do you think next-gen hardware can aid this?

Tony Leier We're

doing a lot of really neat things with the current generation of hardware that are a big step forward for the city-building genre. Being able to look around and see a really neat city that you've built is really cool. We're still exploring some of the things we can do with the current generation of hardware. As for the next-generation of hardware, city-building games really benefit from more texture memory and processing power. As new hardware gives us more power, city-building games can have more detailed textures and models, making cities more and more detailed and alive.



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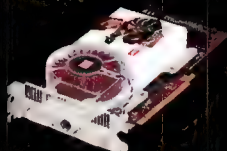
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Looking at
tech from
the inside

X-RAY

Windows on Mac

James Wang wants to know if this most unholy of unions is up to scratch.

Until the switch to Intel processors, Apple computers were distinguished from most PCs by two core traits: their use of the Mac OS operating system and the PowerPC CPU.

There have always been questions on why Apple had to be so different. Its insistence on pushing MacOS has done the industry much good and ought to be commended. Since its launch in 2001, OS X has evolved into a highly stable, secure and enjoyable platform. Its iLife software suite is the envy of many PC users. The latest release of MacOS, OS X Tiger, features built-in desktop search and a stylish widget system called Dashboard. In style and substance, it is in many ways superior to Microsoft's ageing Windows XP. That it's beyond the reach of most viruses and malware is just a bonus.

Apple's devotion to the PowerPC architecture is harder to justify. It is true that the PowerPC instruction set is cleaner and more efficient than Intel's x86 instruction set; PowerPC's early performance often exceeded the fastest x86 processors. PowerPC's robust AltiVec unit offered SIMD performance so impressive that it has now trickled down into the Xbox 360 and PlayStation 3. But these benefits were intangible to the consumer. Costs were high, clock speed improvements were slow and Apple was left with MHz processors while Intel processors rocketed to the GHz range. Consumers saw bigger numbers and more software titles for PCs and flocked to them. Apple

was left in the cold. Its market share slipped.

After many years of decline, Apple finally accepted the unpleasant truth: The PowerPC architecture, despite all the mystical advantages, was a burden, not an advantage; if it just switched to Intel, its hardware would be more compatible, its performance always up to date, and it would naturally sell more computers.

The switch was announced mid-last year. By January this year, Apple was shipping Intel powered desktops and notebooks. By the end of the year, every new Apple computer will be powered by Intel processors.

Even before the Intel Macs shipped, speculation on whether it could run Windows was already rife. When January came and the first Intel Macs hit the stores, Mac enthusiasts plunged right in. A few weeks later a website was set up with the purpose of finding a way to run Windows XP on the new Macs. Donations poured in and soon the prize pool for the successful hacker reached \$13,000. A mere two months later, two hackers claimed this prize. Although this was a triumph, the long and precarious procedure they devised was greeted with more admiration than adoption. There was much fanfare, but no one expected what came next.

Boot Camp

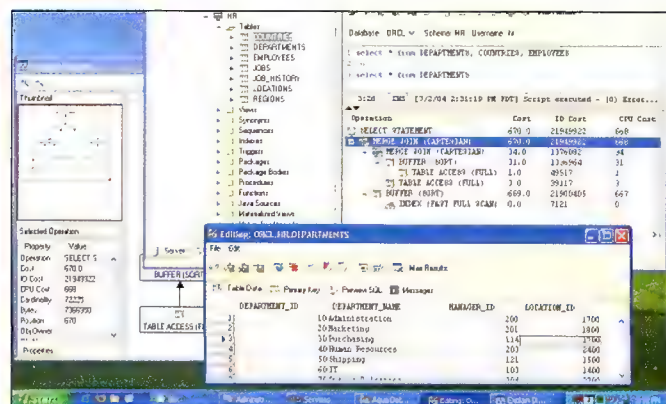
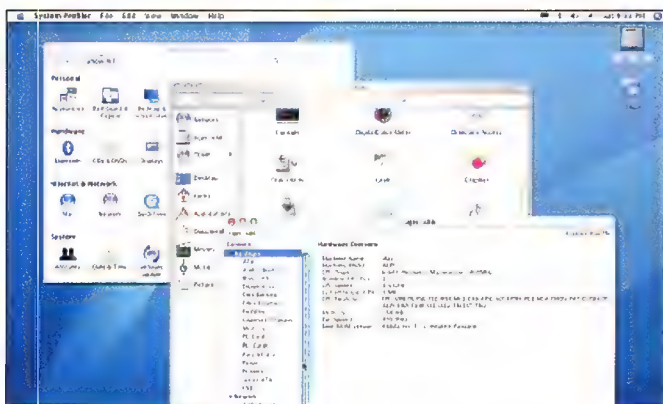
Apple's one page press release on 5 April was cool and restrained; it was releasing Boot Camp

– a tool that would help users install Windows XP on any Intel-based Mac. Apple deliberately toned down the release, emphasising the beta nature of the tool and stating that it had no intention of selling or supporting Windows. Though Apple may not proclaim it, Boot Camp, along with the switch to Intel, completely changes the nature of the Mac. Later in this article we'll explore what the future holds, but for now, let's head to Boot Camp.

The 83MB Boot Camp download includes a disk partitioning utility and the Windows XP drivers for graphics, sound and various hardware included with the new Intel Macs. You'll need your own copy of Windows XP – both Home and Professional editions are fine – but it must have Service Pack 2 included. Boot Camp will then walk you through the three key steps for running Windows.

First the drivers are burned to a CD. Then, the hard drive is partitioned and finally Windows is installed. In the final step the wizard goes out of sight, the screen takes on a jarring blue, and you'll know that you're deep in Windows installation land. A few reboots later and you'll be greeted with a pleasant start-up screen offering a choice of Windows or OS X.

Once in Windows, simply install the drivers and you're set to go. As Boot Camp is still very much beta software, a few things are still unsupported. On the MacBook Pro, the function keys are out, the built-in iSight camera doesn't work and the



▲ A brave move from Apple: Boot Camp allows you to choose whether to use Windows or OS X on your Intel-based Mac.

Test platform: Macbook Pro

- 1.83GHz Intel Core Duo
- 2MB on-chip shared L2 cache
- 667MHz front side bus
- 1GB DDR2 SDRAM @ 667MHz
- 80GB serial ATA hard drive
- 128MB ATI MOBILITY RADEON X1600 (CATALYST 6.14)
- 15.4" 1440x900 LCD widescreen display

Delete button is mapped to Backspace, making a Ctrl+Alt+Del combination impossible. Incidentally this means that with Server versions of Windows, you won't be able to log in. Installing the Windows Resource Kit Tools allows you to remap the keys and fix this problem. An external keyboard also solves the problem.

These small issues aside, graphics, chipset and IO drivers all worked smoothly; hence DirectX works, OpenGL works, and yes, games work too.

Benchmarking

We ran 3DMark first because, unlike certain games, this benchmark has never been ported to the Mac. The Macbook did well, earning 2588 3DMarks in 3DMark05. In the 3DMark06, however, it struggled a lot more, breaking out with 1100 3DMarks.

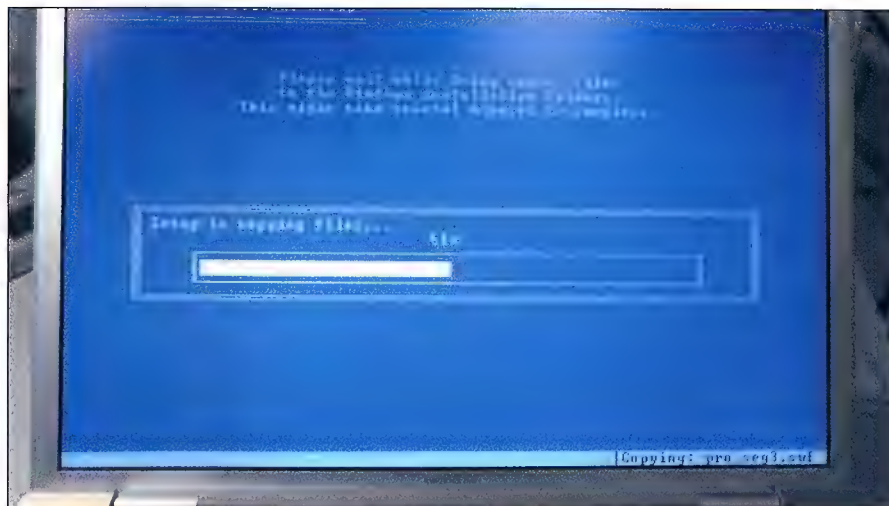
We loaded up Doom 3 with high quality at 1024x768. The Mac didn't take it well, churning out a disappointing 24.8fps. This is alarmingly low; many grandma PCs can do better.

We moved on to Battlefield 2. Here the picture improved somewhat, at 1024x768, we averaged 40fps on the Dalian Plant map. Although the framerate wasn't mind blowing, we found ourselves playing for much longer than planned.

In Half-Life 2 the Mac proved very playable, producing 40fps at the crisp native resolution of 1440x900. Turning on 4xAA chopped the performance down by half, to 19fps. We also ran the Counter-Strike: Source stress test. At 1440x900, it cruised through with a cool 60fps.

The gaming benchmark results may seem low for a laptop equipped with a MOBILITY RADEON X1600. This is because Apple chose to clock the MOBILITY RADEON very modestly. On the Macbook Pro we tested, the core and memory was clocked at 310MHz and 300MHz respectively. In comparison, the ASUS A7G, another notebook powered by the same chip, is clocked at 470MHz for both core and memory. Other than Doom 3's unusually low result, the performance is roughly in line with the hardware capabilities of the Macbook Pro.

There have been some outcries that due to heat problems, Apple has deliberately underclocked its GPU. This is a misunderstanding. The MOBILITY RADEON is a GPU architecture and



▲ Boot Camp leads you through the three-step set-up for Windows. When you hit this screen you'll know you're deep into Windows installation land.

can be deployed at a range of clock speeds. Different laptops have different thermal design points and these restrict how much heat can be dissipated in a particular part of the chassis. Thus a mobile GPU has no official clock speed, but only that which is viable for a particular notebook chassis. Apple decided 310MHz was right for the Macbook Pro, ASUS had more room so went up to 470MHz; both are legitimate. That said it hasn't stopped avid users from using third party tools to overclock their GPU. Speeds of over 400MHz have been achieved with very good scaling.

Overall, gaming on the Mac is now finally

PowerMac could compete with Alienware PCs for prestige and performance. With Core 2, Apple's performance line will be complete, and serious gaming on the Mac will become a reality.

The future of Boot Camp is equally exciting. The next logical step is to support the running of Windows and OS X concurrently. This is already available with 'Parallels', a piece of third party virtualisation software that allows Windows to run natively within OS X. Apple's next OS X release (Leopard) will have Boot Camp built in. This may or may not support multiple operating systems running concurrently but such a development is bound to occur.

The key technology that will support this development is Intel Virtualization Technology (VT), previously called Vanderpool. The goal of VT is to provide proper hardware support for running multiple operating systems concurrently. VT does this by supporting a new software layer that sits below the operating system. Software in this layer is called a virtual machine manager. These virtual machine managers can then launch and manage multiple operating systems. So just as application multitasking was enabled by operating systems, multiple operating systems will be enabled by virtual machine managers.

All this wouldn't be so exciting if Intel Virtualization Technology wasn't built into the new Macs. They are, and it won't be long until Apple or someone else starts exploiting it. The future is not just OS X, Windows and Linux running concurrently – it will allow *multiple* instances of any OS running in real time. Because OS X is exclusive to Apple, virtualisation for desktop PCs will be most lucrative on the Mac.

So there we have it: Conroe, Leopard and Vanderpool, three key technologies that together will enable a completely new breed of Macs.

Picture the PowerMac of next year; quad-core driven, sporting the latest GPU and supporting any operating system that's ever been compiled for Intel x86. Add to that a magnificent case, a brilliant Apple Cinema Display and we will have a new breed for maximum power computing.



viable. The performance we observed is nothing to write home about, but given that the tests were carried out on a notebook and everything had beta stamped over it (the ATI drivers were not even WHQL certified), we were fairly pleased with the results.

What comes next

A look at the current PowerMac G5 reveals Apple's philosophy on the high end: maximum power, ultra-high bandwidth and total expandability. The enclosure is in itself a work of art and the internals are designed for optimal airflow and usability. A Core 2 Duo-equipped

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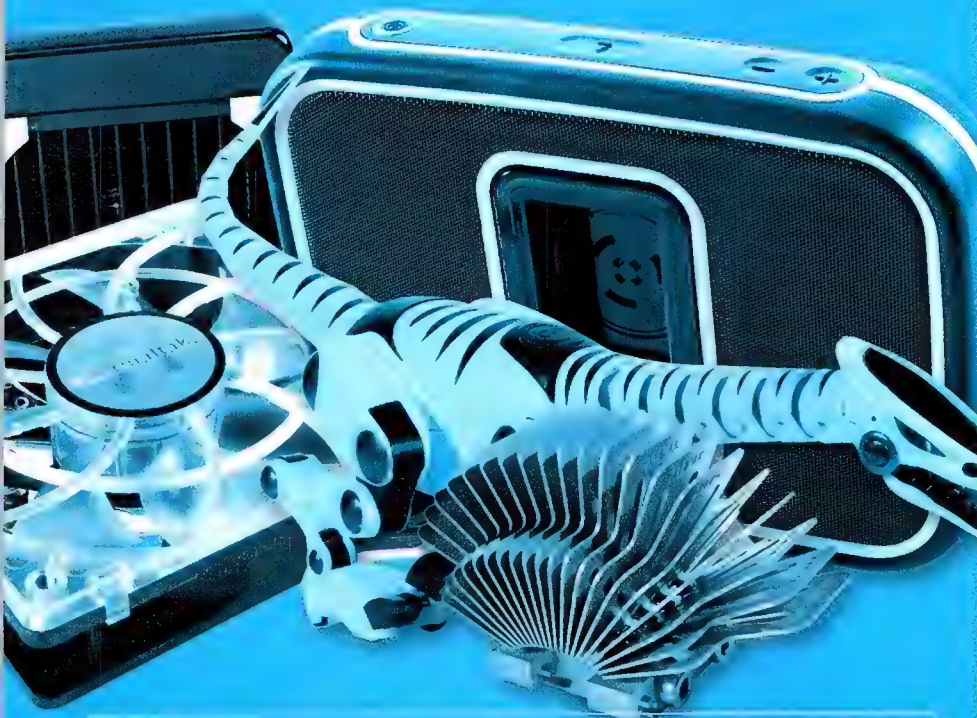
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HARDCORE

NEWS, REVIEWS AND ROUNDTUPS ON THE LATEST
HARDWARE TECHNOLOGY FOR YOUR BOX



Maybe I guess that's what I'm supposed to say, being a cat and all. I'm seriously a cat. I'm a tech kitty — a feline master of the technology arts. Send me an email if you can figure out what that means, exactly, because I'm of a feline mind. Not that I can check my email, you know, with the paws and all.

You're probably wondering where Blogger went. Don't worry, he's still here. He was just kind enough to let me introduce myself — I try. Was kind enough, you see, I released some much crying and shedding of pixels.

A few months ago I moved into this Linux (it's a funny old word) been checking out the latest bit ever from it's quite an hotspot, especially for a cat as I'm sure as I am. For the last week or so I've been helping Craig learn about all those AMD motherboards. My whiskers kept getting in the way, but he didn't seem to mind as much. Craig would just politely brush me off the desk and I'd go back in my box (I think it's actually a Shredder case).

Food wasn't the greatest thing to come by when I first moved in, even with persistent meowing. It was only after I released myself on a pile of electricity, looking great. For the opportunity gave me something to eat.

I think you're also why my paw is

kind of to write it, it's just to keep me out of trouble. But hey, I think it's a great opportunity to tell you how super this issue is. Well, the hardware stuff anyway... Oh, only the pieces I have left. Everything else you read at your own risk.

With the AMD2 roundup (the best ever), the awesome gadgets in Kitlog (that AMD logo on it is pretty schmick—we're even giving some away on page 94!), Dell's latest 2407 LCD screen (I wanted to look like a boss, right?), and even the attempt at a home theater PC (it's my new home, we have a packed hardware section for you too, even). The only thing I can think that would make it even better is if we were giving away some giant bowls of milk, or a few bottles of ketchup... but I don't know the guys are kind of other kids.

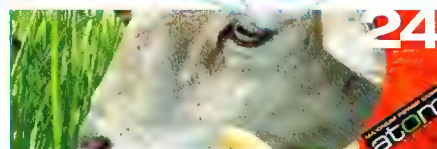
Anyway, please enjoy the following pages. Craig, Logan and everyone else would want to get them all done, including me. If you'd like me to pass anything on to them, don't hesitate to contact me at Dervent's email address below. Don't worry—I'm meowing very, very loud for my own cat.

Yardley the Tech Kitty
wants some chow.

yardley@catsoftech.com



this month



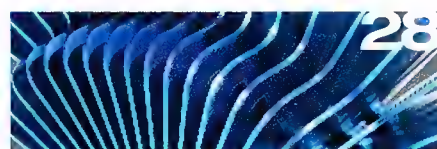
Tech Trends

Magnetic RAM is explained in detail. It's extremely interesting, really.



Ground Zero

Dan Rutter shows you how to do sexy-looking LEDs with minimal effort.



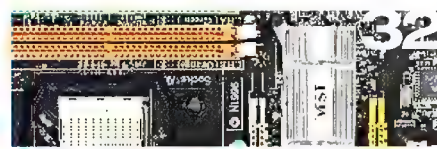
Gearbox

How much gear can we pack into two pages? Why not have a look?



Framerate

Here is where we do video card benchmarks. Don't believe us? See for yourself then!



Head to Head

AMD's AM2 is calling... make sure you get the right board with this round-up.



Kitlog

Instructions on building the best PC systems, no matter your budget.



Dell 2407 Revision A02

Lian-Li PC-V300	38
Pertelian X2040	39
Swiftech H20-220-T	39
Thermaltake Toughpower 750W	40
Thermaltake Matrix	40
Cool-Trek Vostok	41

short
circuits

The R580+, which is likely to be ATI's last DX9 piece, has been officially renamed to the X1950XT. An XTX version will also be made available – expect it around spring.

Creative has released a long-awaited update for its X-Fi sound card, resolving some of the crackling problems, and fixing issues with Quake 4, Battlefield 2 and Doom 3. King Henry V is reported to be ecstatic, having seen two driver updates since he was born.

Internet Explorer 7 Beta 3 has hit the Web, ready for your browsing pleasure. You can now reorder tabs, horizontally scroll while zooming, RSS feeds update automatically, and following Mozilla's extension methodology, add-ons have been made available at www.ieaddons.com.

Microsoft has confirmed once again that it has no plans to include HD-DVD by default in the Xbox 360. Unlike Sony, which is attempting to trojan Blu-ray into the industry by including it with the PS3, Microsoft is committed to the 360 as a games console first.

HIS has made preparations for a PCI-E 1x video card. Based on ATI's X1300 chipset, it looks like PCI-E 1x might finally get the attention it deserves, rather than being another iteration of the useless AMR/CNR slot.

Plextor is the most recent of drive manufacturers to announce a Blu-ray burner, this one capable of both single (25GB) and dual (50GB) layer burning. Never fear about legacy support, because old favourites are also supported with 8x DVD+R/-R/+RW, 6x DVD-RW, 4x DVD+R/-R DL, 5x DVD-RAM, 24x CD-R and 16x CD-RW writing speeds. No price as of yet, but expect something super crazy-arse high until the format wars begin in earnest.



Seagate lubes up

Craig Simms observes new tech saving.

In what seems to have become a tradition for hard drive manufacturers, a new storage technique has emerged, once again extending the life of magnetic storage. Every time we think it's going to die, something else pops up giving us a few extra GB, and we love it. Once again it's Seagate doing the innovating, and considering its current dominance we are not surprised.

On your typical hard drive, the smaller the grains are on a disk, the greater the areal density, and hence the more data can be stored.

However beyond certain operating temperatures, this data is no longer considered 'stable'.

Thermal stability (and therefore data density) can be increased by employing harder magnetic materials, however standard write heads can't produce a significant enough magnetic field to write to this material.

To achieve this, an area on the medium can be temporarily heated by a laser to soften the material, allowing the write heads to more easily direct the magnetisation. The rapid cooling of the surface subsequently stabilises

the data, and the need for expensive new write heads is circumvented. This is known as Heat Assisted Magnetic Recording (HAMR), and has been the subject of research since 2001 in the quest to overcome the superparamagnetic limit.

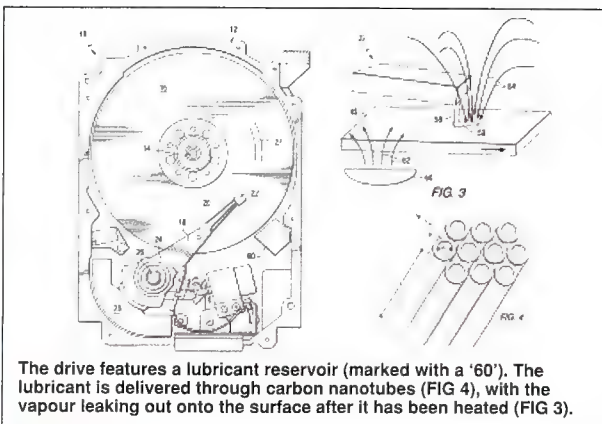
The superparamagnetic effect occurs when small crystals are subjected to enough thermal energy that their magnetism destabilises – so in a hard drive context, your bits start flipping randomly between ones and zeros, corrupting data. The smaller the grains and the greater the heat, the more likely this is to occur. It is this effect which is currently targeted as the main perpetrator of hard drive size limits.

HAMR hasn't yet been implemented at the consumer level, because the increased heat has been found to degrade or completely remove standard lubricants from the media – resulting in an exposed surface and increasing the chances of disk damage.

Seagate's solution is a self lubricating system, delivered via a thin film composed of carbon nanotubes. Lubricant vapour is stored in a reservoir, and during HAMR operation, the vapour is delivered to the surface before

an affected area hits the write head – typically in one rotation. Enough lubricant will be stored to last from five to 10 years – thankfully exceeding most drive warranties.

This, in combination with perpendicular recording, should open up the field for higher density drives for a few years yet – there's a lot more blood to be squeezed out of the stone that is magnetic storage.



The drive features a lubricant reservoir (marked with a '60'). The lubricant is delivered through carbon nanotubes (FIG 4), with the vapour leaking out onto the surface after it has been heated (FIG 3).

Magnetic RAM

Magneto resistive
– it must be the X-Men,
says Craig Simms.



After more than a decade of research, Magnetoresistive RAM (MRAM) is ready for market, courtesy of Freescale Semiconductor, a spin off of Motorola. Unlike conventional RAM, which stores using electrical charges, MRAM uses, you guessed it – small midgits attached to the propeller of a plane. Err... we mean magnets.

Unlike typical RAM, MRAM is non-volatile, and compared to flash doesn't degrade nearly as quickly, giving it a tempting allure for data storage pundits worldwide.

This midget magnet memory is constructed from an array of cells, each containing two ferromagnetic plates, one hard (set to a permanent polarity) and the other soft (can be influenced by an external field). These are separated by an insulating tunnel layer, the comprised set of these (the cell) being called the magnetic tunnel junction (MTJ).

Writing a 1 or 0 in any such cell is as simple as setting the soft layer to a particular polarity – done by sending a small current down the bit and word lines of the array, switching the cell at their intersection. Typically if the polarity of the soft and hard plates are identical, this is treated as a 0.

Reading is slightly different – a voltage or current is sent down intersecting lines, which will meet electrical resistance from the magnetic field. The resulting current/voltage is then measured, compared to the reference and the found resistance allows the device to determine the polarity of the soft plate, hence whether the cell is set to 0 or 1.

Newer devices are looking into a method that

uses polarised electrons (so their spin is aligned) to create the magnetic field. Called spin torque transfer, this has a desirable side effect of lowering current, meaning density can be increased as the polarity of nearby cells will not be affected as much as when using standard methods.

A few different architectures exist, but the basic principles remain the same. All this leads to a few desirable things. Lower power consumption is the first – compared to DRAM, MRAM needs no refreshes, and uses considerably less charge than flash to set the bit.

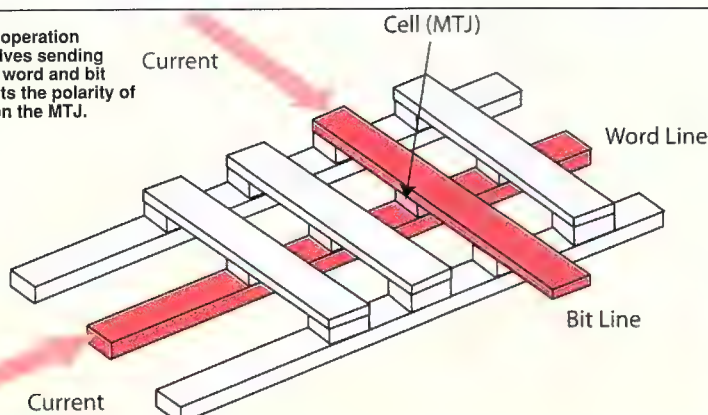
Speeds are close to that of SRAM, with IBM having demonstrated MRAM running with access latencies of 2ns.

Then of course there's the non-volatility, high resistance to radiation, as well as high temperatures – meaning mission critical applications such as military or aerospace will probably be the first implementations.

Density is a problem though, and for now flash truly has an advantage. MRAM has been capturing people's imagination for a while however, and has even been dubbed the 'universal' memory, so expect researchers to burrow in and make hefty leaps and bounds over the next few years, providing memory manufacturers can strip their attention away from the in-demand flash.

The ultimate goal of MRAM is not only to replace the flash market, but to end up in PCs for truly instant on and off functions – something which is hugely important in the HTPC and mobile worlds.

A typical write operation for NRAM involves sending currents down word and bit lines, which sets the polarity of the soft plate on the MTJ.



short circuits

Out of AMD is a 'Dual Core Optimizer'

– a driver that can apparently improve 'some PC gaming video performance'. In particular, it bypasses the Windows API and synchronises the timestamp counter on both cores, increasing compatibility with older games that would crash due to out of sync errors or running too fast, a result of not being able to handle running on multiple threads. You can grab it from www.amd.com/us-en/Processors/TechnicalResources/0,,30_182_871_9706,00.html.

Optical media just keeps getting denser.

Some boffins at Kyoto University have developed a finely-tuned laser that can be configured to be up to 10 times narrower than previously developed lasers. Of course this means, ignoring media limitations, that data could be packed up to 10 times more densely. So the average geek's porn collection should now fit on 200 discs, instead of 2000.

HOT OR NOT

Your monthly guide to fashions and faux pas in the tech industry.

Core 2 Duo

Intel's time in the sun.

Windows

Now available on a Mac

RAID 5

The 'R' is there for a reason.

Wonder White bread

Fibre for the body.

Flash drives

Rid us of Zip and floppy disks.

AM2

Where's the Ace up the sleeve?

OS X

Becoming another Windows.

RAID 0

What, are you crazy?

Telstra

Fibre to the monopoly.

The Flash

When will the superhero movie era end?

Steve Jobs has rolled the dice, bringing Windows to the Mac.



GROUNDZERO

Dan talks tech
like you've never
heard before

GROUND ZERO

The embarrassingly
easy case mod

Daniel Rutter is full of bright ideas.

The problem with basic electronics projects is that they have a very bad 'effort to result' ratio.

OK, you have to learn to solder somehow, but the niftiest thing you're likely to end up with after working your way through the whole *Let's Learn About Wires* kit series is a weeny FM transmitter.

So here, for your delectation, is a *Things You Can Make* that's easier than that very first two-LED flasher kit, and creates a genuinely cool (though not, I grant you, especially useful) effect.

You've probably seen little LED lights of various kinds that cycle through red, green and blue, and then numerous psychedelic combinations of those colours. They're popping up all over the place – in those twinkly mobile phone antennas, in novelty key-ring flashlights, as decorations for the burgeoning sector of Random Things That Run From USB Power Products, and so on.

In the olden days, the only way to create this sort of effect was with three separate lamps and a control box of some kind.

Then along came low brightness multi-lead LEDs that combined two or three different coloured dies in one normal 5mm package, but still needed outboard driver hardware.

Then there were high brightness versions, just one of which could deliver pen light brightness.

And now we have simple two-lead LEDs with three dies and control hardware, packed into a minuscule chip inside the standard-sized LED itself.

These RGB LEDs don't let you control their colour or cycle rate – they just loop endlessly through their fixed sequence of colours. You can get fast-change, slow-change and flash-flash-flash versions, but you can't turn one into another. And they don't project their three pools of light on top of each other – you get three separate circles of light.

Furthermore, no two of these LEDs will cycle at exactly the same frequency, so you can't make a synchronised array of them. A significant percentage of them have their own odd opinion about what colours to show.

All of this can be forgiven, though, because a bag of fifty slow-change LEDs on eBay ought to cost you no more than \$20 delivered.

And, importantly, they don't even need a series resistor. Normal LEDs pass more current when they get warm, which makes them warmer, which causes them to pass more current, and soon you have what's known to us professionals as a 'friode'. You need some kind of current limiter to stop that from happening. But the controller chip in an RGB auto-LED does that for you. All you need to do is feed the LED the right voltage.

'The right voltage', I'm happy to say, is about three volts. You need at least 2.8V for all three dies to light at reasonable brightness – from 2V, only the red die will light – and they'll be brighter from about 3.7 volts. But 3V works, and is very convenient.

You have a lovely high current 12V rail inside your PC. You can thus connect these LEDs together in strings of four (the long leg of each LED is the positive terminal) and run them straight from +12V (that's the yellow wires, kids). Each string will only consume an average of about 15mA, so you can run pretty much as many of them in parallel as you like without straining a PC PSU.

Presto – instant disco fever case mod.

You can get multiple-of-three voltages from lots of other things, too – any even number of ordinary 1.5V batteries in series, for a start. Retro-fit that old torch!

A string of five NiMH or NiCd cells gives 6V; now there's a use for those dusty model car batteries with one dead cell.

Repurpose old plugpacks

to run a string of RGB Christmas lights!

So there you go, electronics noobs. At long last, your first step into the world of basic circuits can be groovy.

Electricity has done wonderful things to Dan's hair.
dan@atomicmpc.com.au



Your PC, AcBel Green Power Cares



True RoHS

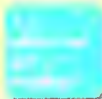
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Roboreptile ▶Supplier **Wowee**Website www.wowee.comPrice **\$139**

Great to look at... but not exactly the most exciting thing to play around with. Sure, it roars and moves around, but definitely not at the speeds of the raptor it looks to be modelled on. Although it has the appearance of many leg and arm joints, the little dino moves with all the grace of an arthritic elephant. However, if you know someone who is utterly crazy about animatronic, plastic-plated replicas of 65 million-year-old extinct species, then you could do worse than the Roboreptile.

**Scythe Kama Bay** ▲Supplier **PC Case Gear** Website www.pccasegear.com.au Price **\$36**

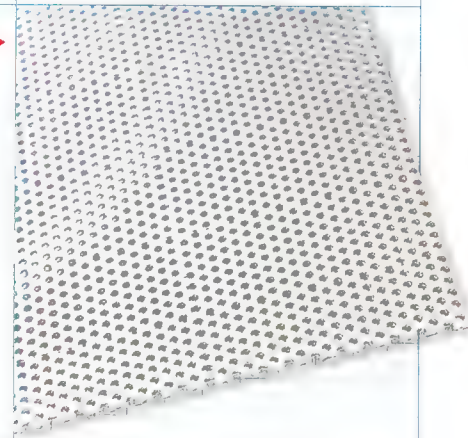
Cooling eh? It's all the rage, especially quirky drive-bay fans that blow air inside your system. The Kama Bay from Scythe is one such device, except you have the option of mounting it horizontally, so it cools your drives, or vertically so your motherboard and CPU catch some breeze. The fan itself is a 120mm, 800rpm job and is obviously designed to be silent. There's even a sturdy grill to keep dust (and fingers) out. The included power connectors will slip into just about anything, except a floppy drive plug.

Iomega Micro Mini ▲Supplier **Iomega**Website www.iomega.comPrice **\$230**

Probably the lightest portable hard drive you'll ever see, the Iomega Micro Mini has no problems just sitting in your pocket, on your desk or in a tsunami. The one we had to play with was 8GB, however there's a 4GB version for those who don't think they could fill that much space. It's USB 2.0-compliant so it'll happily download and upload data at breakneck speed. Just watch the connector – it doesn't quite 'stick' into its provided hidey-hole and tends to poke out from time to time.

A.C. Ryan Acryl Panel ▶Supplier **PC Case Gear**Website www.pccasegear.com.auPrice **\$27.50**

This 500x500mm power-coated steel panel is a great replacement for a Perspex window as it not only provides a way to see the insides of your case (it's mesh) but also has better EMI shielding and, well, actual airflow over a solid chunk of plastic. The model we had in was a nifty dull silver, but there's also a black panel if you swing that way. Feel free to hack the sucker to size if 50cm² is too big, or buy an extra one if it's not enough.

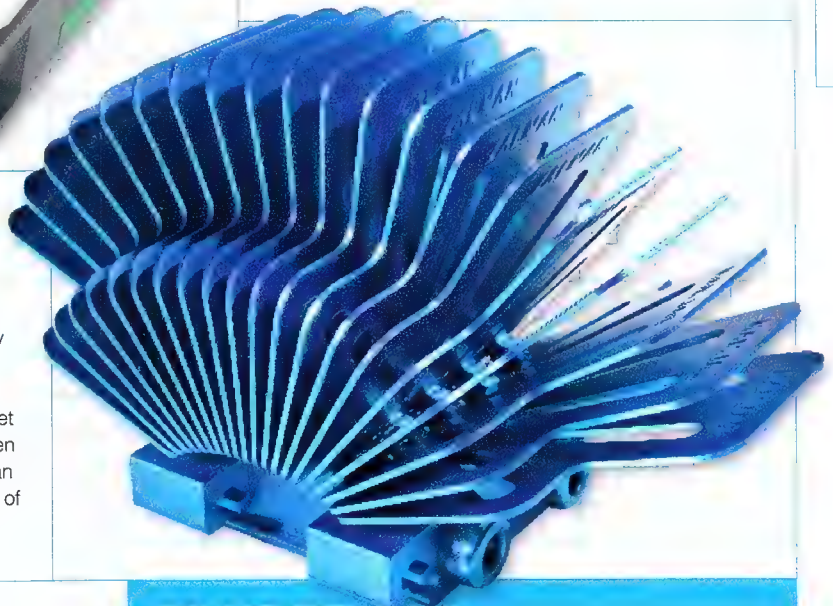




Zalman Fanless Northbridge Cooler

Supplier **Altech** Website www.altech.com.au
Price **\$30**

We're big fans of Zalman, so it kind of surprised us in a way that didn't when we heard of this fanless Zalman cooler. Just like the box says, this little heatsink is devoid of any air-blowing mechanisms, so if you're in the market for a quiet bit of kit to keep your northbridge at sane temperatures, then this is the ticket. Just remember that it stands a bit taller than your average fanned NB cooler, and it might get in the way of your video card, thanks to the wide spread of the fins.



◀ Thermaltake iFlash Mini

Supplier Anyware
Website www.anyware.com.au
Price \$35

This fan does indeed flash and is very mini at 80mm. Despite its size, this little dude spins at a moderate 2000rpm, straddling the line of the silent and the audible. But that's not all, folks! A fixed display appears when this guy gets moving, printing the Thermaltake logo and the temperature reading from the in-built probe. So make sure you put this somewhere you can see it, otherwise you'd be better off with a plain old 80mm job.



**▲ IceMat Siberia USB
Sound Card**

Supplier **GamerzStuff**
Website www.gamerzstuff.com.au **Price** **\$59**

We thought this device was a great bit of kit until we realised we couldn't think of a scenario in which we'd use it. It's not Creative so you're not getting EAX or all of the other cool features that come with a Soundblaster or Audigy, and if you don't have one of these cards, the Siberia isn't going to steal any awards from the capable Realtek AC'97 on your mobo. If you have a really old laptop with a buzzy PC speaker, then this may be an option, unless of course it doesn't have USB.

BILL'S REVIEW

Altec Lansing IM9 Mobile Audio

Supplier Address: Website: www.innovation.com.au
Price: \$940



BENCHMARK

How we test,
what we test,
when we test it

3 DMark05 and 06 are the legs of our bench. As freely downloadable tools, they allow people all around the world to compete on a single platform, regardless of its indication of real world application, and its ability to keep our table stable.

On the gaming surface, Call of Duty 2 takes first honours in the FPS department. Quake 4 follows closely behind for our OpenGL benchmarks, taking over from where the venerable Doom 3 left off and offering multiple CPU optimisations. Half-Life 2 remains, its market penetration simply too huge to ignore. X3: Reunion makes an appearance, in an effort to have a benchmark that is not an FPS. In the same line, Splinter Cell: Chaos Theory has also been added. Other games do exist. Honest.

All tests are run at 1280x1024, 1600x1200 and 1920x1200 with vsync off, to cater for the most popular LCD resolution, CRT resolution and those who own widescreen monsters respectively.

To hit the CPU, we use LAME MT, a multi-threaded version of the



The Atomic Hot Award is given only to the best. In our roundups, we differentiate the best further using the following awards:

VALUE AWARD This means the product is the best buy price-wise.

PERFORMANCE AWARD Price isn't a big factor – it just has to make our benchmarks burn and our eyes water.

EXTREME AWARD Forget everything. If it's mind-blowingly amazing, then it'll get an Extreme Award.

popular MP3 encoder, which is used to compress a standard 30-minute WAV file. Similarly, VirtualDubMod is used to compress a standard 1GB raw video file into XviD at 1300Kb/s. Other CPU specific tests in our stable are Maxon's CineBench and SuperPi Mod. Rounding out the suite, SiSoftware's Sandra tests several subsystems across the board, while HDTach and ATTO Disk Benchmark helpfully provide hard drive scores.

All these tests are run on a Windows XP SP2 platform, running the latest official drivers available. Every test is run three times to eliminate any oddities that may crop up along the way, the final result printed in the magazine being an average of those scores.

Of course, all this is pointless without a standard set of hardware, and as such it is laid out below for the world to see. On with the testing!

BENCHMARKS

Graphics

3DMark05
Game tests only, 4xAA, 8xAF
www.futuremark.com

3DMark06
Game tests only, 4xAA, 8xAF (SM2.0), 8xAF (HDR/SM3.0)
www.futuremark.com

Half-Life 2
Canals custom timedemo, 4xAA, 8xAF, all details highest, HDR off
www.half-life2.com

Splinter Cell: Chaos Theory
Lighthouse Demo, Shader Model 3.0, 8xAF, shadow resolution high, all features on
www.splintercell3.com

X3 Rolling Demo
High settings, auto quality control disabled, glow enabled, 4xAA, 8xAF
www.egosoft.com/games/x3/info_en.php

Call of Duty 2
Hill 40 – Defend custom timedemo, 4xAA, 8xAF, all options highest
www.callofduty2.com

Quake 4
High quality, 4xAA, 8xAF, Multiple CPU support, all options highest
www.quake4game.com

Subsystems

HDTach
www.simplisoftware.com

LAME MT
softlab.technion.ac.il/project/LAME/html/lame.html

VirtualDubMod
virtualdubmod.sf.net

SuperPi Mod
www.xtremesystems.com/pi

Cinebench
www.cinebench.com

SiSoft Sandra
www.sisoftware.co.uk

Everest
www.lavalys.com

Others

DisplayMate
www.displaymate.com

ATI Tool www.techpowerup.com/atitool

RivaTuner
www.guru3d.com/rivatuner

FRAPS
www.fraps.com

CPU-Z www.cpuid.com

Stress Prime 2004
sp2004.fre3.com

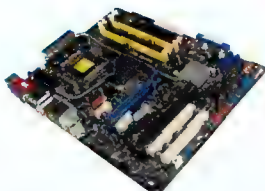
ATOMICBENCH Our standard hardware that gets regular labs lovin'

intel



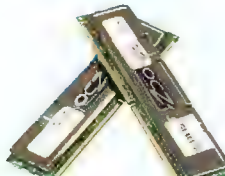
▲ Intel Pentium 955 EE

ASUS



▲ ASUS P5N32-SLI Deluxe

OCZ Technology



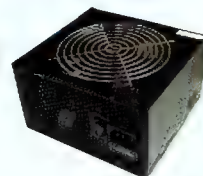
▲ 2GB OCZ PC2-4200EB

WD Western Digital



▲ Western Digital 1500ADFD

PC Case Gear



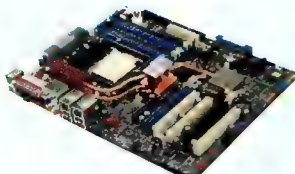
▲ Seasonic S12 600W

AMD



▲ AMD Athlon 64 FX-60

ASUS



▲ ASUS A8N32-SLI Deluxe

OCZ Technology



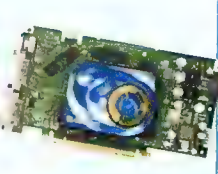
▲ 2GB OCZ PC-4000EB

DELL



▲ Dell 2405FPW

Albatron



▲ Albatron 7900GT



Our look at the
fast, the furious
and the pretty.



Galaxy 7300GT

GPU **NVIDIA 7300GT**
Memory size **256MB**
Core clock **580MHz**
Effective memory clock **1600MHz**
Memory type **256-bit GDDR3**
Pixel processors **8**
Vertex processors **3**
Video out **DVI; VGA; component**
Video in **None**
Price **\$TBA**
Supplier **AKA Technology**
Website **www.akatech.com.au**

This crazily overclocked 7300GT ripped through the benchmarks, although there is of course only so much a 7300GT can do, no matter how high the clocks climb. Interesting is the inclusion of a single VGA port, rather than dual DVIs and dongle. There are no games here either, with just a driver disc being included. Still, if you're on a ball-breaking budget and you're not too fussed about the latest games, the 7300GT could find itself at home in yours, your parents' or your granny's PC – you know, if she fancies a bit of Counter-Strike.

Xpertvision 7900GT Sonic

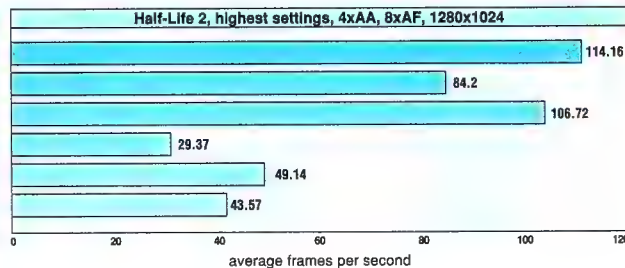
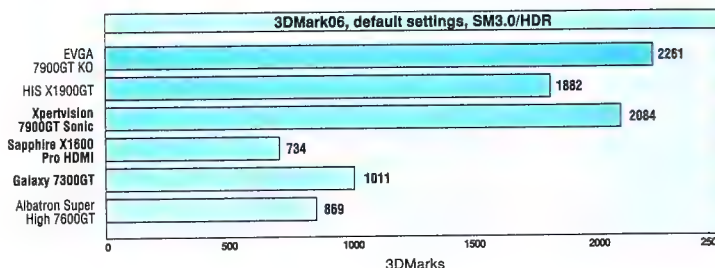
GPU **NVIDIA 7900GT**
Memory size **512MB**
Core clock **550MHz**
Effective memory clock **1320MHz**
Memory type **256-bit GDDR3**
Pixel processors **24**
Vertex processors **8**
Video out **DVI; D-Sub; S-Video; composite; component**
Video in **None**
Price **\$594**
Supplier **Altech**
Website **www.altech.com.au**

Overclocked 7900GTs are a dime a dozen, although considering the spate of stories we've heard about home overclocked 7900GTs going the way of the dodo, it would seem smart to buy one that's pre-overclocked with a warranty. To that end, Xpertvision has supplied their 'Sonic' edition card, complete with the well received Toca Race Driver 3. Although the fan whines a bit, the heretical red PCB and DVI ports scream 'fast'. Red goes faster, didn't you know? (Yellow comes in a close second – as long as it's canary yellow.)

Sapphire X1600 PRO HDMI

GPU **ATI X1600 PRO**
Memory size **256MB**
Core clock **500MHz**
Effective memory clock **792MHz**
Memory type **128-bit GDDR2**
Pixel processors **12**
Vertex processors **5**
Video out **HDMI; VGA**
Video in **None**
Price **\$299**
Supplier **Sapphire**
Website **www.sapphiretech.com**

This is the first HDCP/HDMI card that's entered the labs, and it's purely built for HTPCs. There's a dongle that will convert the HDMI to DVI if necessary, a long HDMI cable included and SPDIF in, although if you're willing to sacrifice the last item, you can attach a half height bracket to make the card slimline, for the perfect HTPC solution. PowerDVD6 and Sapphire's excellent 'Select' program is offered for your choice of one of four games. With ATI's image quality and a decently grumpy yet small GPU, how could you go wrong?



HEAD TO HEAD

Bite-sized comparative roundups of the hottest gear

Is AM2 right for you?

Craig Simms runs a bunch of AMD's new boards through Labs.

AM2 is the new platform for AMD – one more pin than the old Socket 939, 800MHz DDR2, supporting Pacifica and quad core, but otherwise much the same as we knew before. Like Mars' passing of Earth in 2003, or Bill and his stuffed iguana after Chinese New Year, AMD and Intel's platforms are the closest they've been in quite a long time. Core 2 Duo is still pulling away like a pervert at a cheerleading convention, but if you're still sweet on the AMD side, you'll want to know what's available with their latest chips.

There are essentially six chipsets available in the AM2 market, five of which belong to NVIDIA.

NVIDIA GeForce 6100/6150 + 410/430MCP

This low-level board has an integrated GeForce 6 (DX9 SM3.0). The 6150 offers HD video and dual head DVI, while the 6100 is VGA only. The 4x0 MCP is actually based on nForce4 tech, with the 430 supporting four SATA ports and Gigabit Ethernet, Active Armor firewall and support for RAID 0, 0+1, 1 and 5. The 410 by comparison only supports RAID 0 and 1, has two SATA ports and 100Mb/s Ethernet.

NVIDIA nForce 550

The entry-level solution, the 550 supports four SATA ports. RAID 0, 0+1, 1 and 5 are available. FirstPacket technology is here, which preferences VoIP and gaming outbound network traffic for the best performance. Ten USB 2.0 ports and HD Audio are also supported.

NVIDIA nForce 570

As above, but with six SATA ports. It also supports DualNet, the combining of two Ethernet ports into one effective port for a maximum 2Gb/s throughput.

NVIDIA nForce 570 SLI

As above, but with a second PEG slot for SLI goodness. Mind you, with two video cards, the slots will only run at 8x.

NVIDIA nForce 590 SLI

As above, but with 16x for both PEG slots, allowing maximum bandwidth. LinkBoost is

enabled, automatically overclocking your PCI-E and HTT links by 25 percent should you happen to own a 7900GTX or higher. EPP (Enhanced Performance Profile) is also available, for those RAM sticks that support it.

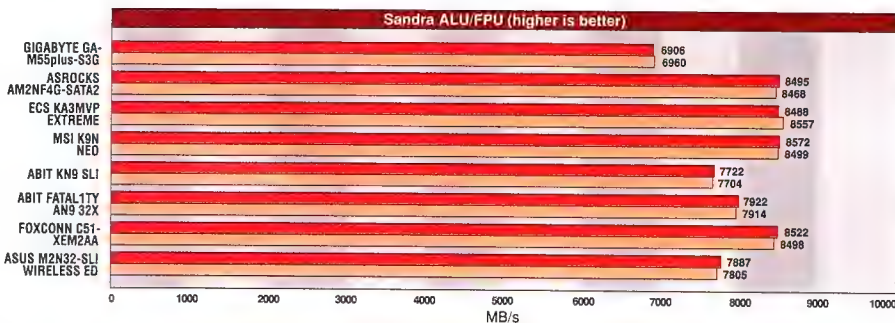
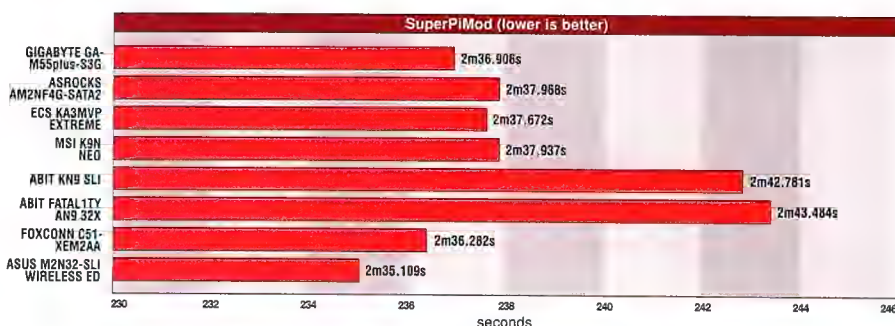
ATI CrossFire 3200 Express

Paired with ATI's SB600 southbridge, the 3200 Express offers two PCI-E x16 slots for CrossFire, 4x SATA and a single Gigabit Ethernet port. Extra SATA and Ethernet ports are usually added by third party controllers. RAID 0, 1, 0+1, 1+0 and 5 are available. Ten USB 2.0 ports are supported.

How we tested

Equipped with an FX-62, our Albatron 7900GT and two sticks of 1GB Corsair DDR2 6400 RAM, we put the boards through their paces using SuperPiMod, SiSoft Sandra's Memory Bandwidth test and Half-Life 2 set to its lowest settings, to see if we could separate them performance-wise.

While the Sandra results should be mostly the same, in reality they are all over the place, despite us confirming that all boards were running at the same timings. It seems that the technology needs to go through another revision before the 800MHz RAM results will stabilise.



FOXCONN C51-XEM2AA

Price **\$315** Supplier **Foxconn** Website **www.foxconnchannel.com**

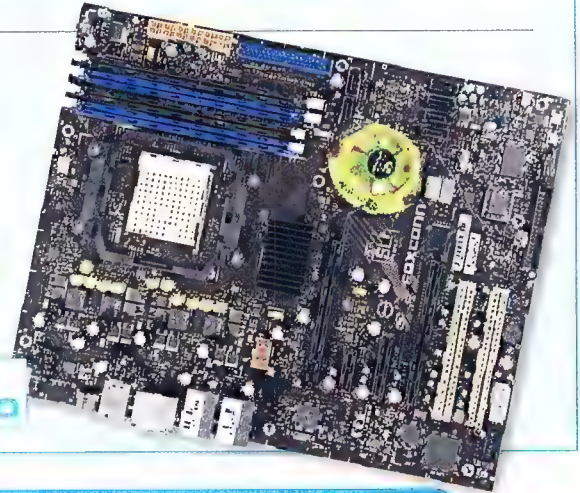
Chipset **nForce 590 SLI**; PCI-E x16: **2**; PCI-E x8: **0**; PCI-E x4: **1**; PCI-E x1: **1**; PCI: **2** HDMR: **0**; E-SATA: **0**; optical SPDIF; 1394A & B; Realtek ALC882D sound.

We were a bit wary of Foxconn's entry based on previous experience, but the fears were unfounded. The C51-XEM2AA (let's just call it Thaddeus, shall we?) performed admirably, and even featured NVIDIA's wonderful BIOS to boot, bringing its configurability to near-DFI levels. In terms of layout issues the floppy connector and a molex power connector are situated at the bottom of the board, and the southbridge features active cooling – which, while not too



loud, still contributes to the overall hum of the system. Oddly there is no E-SATA whatsoever on board or via expansions and the PCI-E clips are reasonably annoying by being placed on the heatsink side. Connectors included in the package are standard fare, but it is price and performance that allow this board high praise.

9.9



ABIT KN9 SLI

Price **\$249** Supplier **Altech** Website **www.altech.com.au**

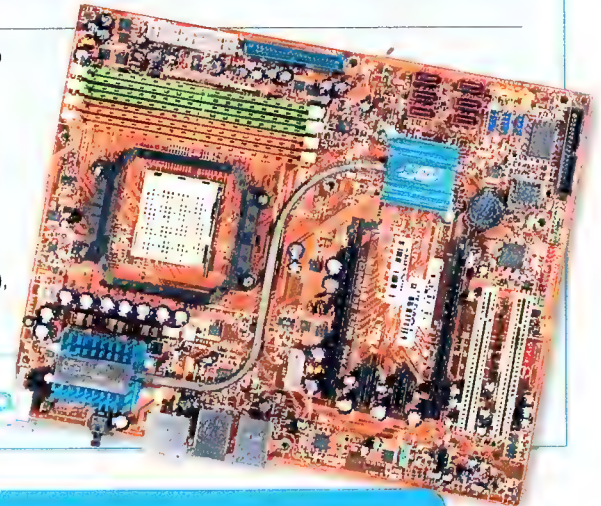
Chipset **nForce 570 SLI**; PCI-E x16: **1**; PCI-E x8: **1**; PCI-E x4: **0**; PCI-E x1: **2**; PCI: **2** HDMR: **0**; E-SATA: **0**; optical SPDIF; 1394A; Realtek ALC882D sound.

Really, in the face of very little performance increase there's no shame in having two 8x PCI-E slots instead of two 16x. Unlike the Fatal1ty, this board will even let you have two dual slot cards and an X-Fi, although one of the PEG slots still has a release clasp on the heatsink side. The floppy connector is still at the bottom of the board (seriously guys, if you're going to make it that inconvenient, just remove it), however it is an entirely silent solution thanks to a heatpipe. Also like the Fatal1ty there is a pair of PCI-E x1 slots – which most people will find pretty useless.

The BIOS is reasonably tweakable (hey, it still offers more voltage than the ASUS), although not to the level of uGURU found on the Fatal1ty – but then this isn't a flagship board.

While nothing special, the KN9 SLI is a good solid board that does the job.

8.9



MSI K9N NEO

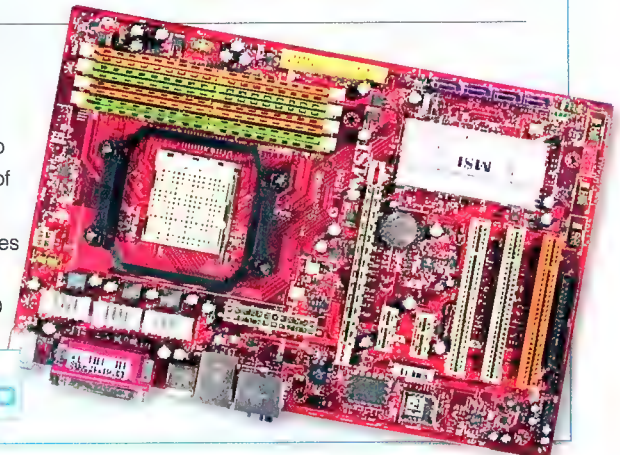
Price **\$149** Supplier **MSI** Website **www.msi.com.tw**

Chipset **nForce 550**; PCI-E x16: **0**; PCI-E x8: **1**; PCI-E x4: **0**; PCI-E x1: **2**; PCI: **3** HDMR: **0**; E-SATA: **0**; Realtek ALC883 sound; parallel & serial ports.

The K9N Neo is smaller than expected – a good 45mm smaller than the competing 570 and 590 boards here. Plenty of PCI slots mean that this is a board for someone on a budget and trying to keep as many old components as possible. The legacy theme continues with parallel and serial ports. It's passively cooled too, although no heatpipes here – just one thumping great flat heatsink for the chipset and a series of three smaller but taller ones for the MOSFETs. It's only a small annoyance, but we'd gotten used to putting RAM in similarly coloured slots for dual channel – MSI requires you to put the sticks in different coloured slots. The BIOS isn't very configurable at all, allowing you to tweak the DDR2 voltage and that's about it. Annoyingly, the FDD connector sits at the bottom here as well.

A nice solid board for someone who needs to save money, and doesn't want to overclock.

8.9



ECS KA3MVP EXTREME

Price **\$TBA** Supplier **Protac** Website **www.protac.com.au**

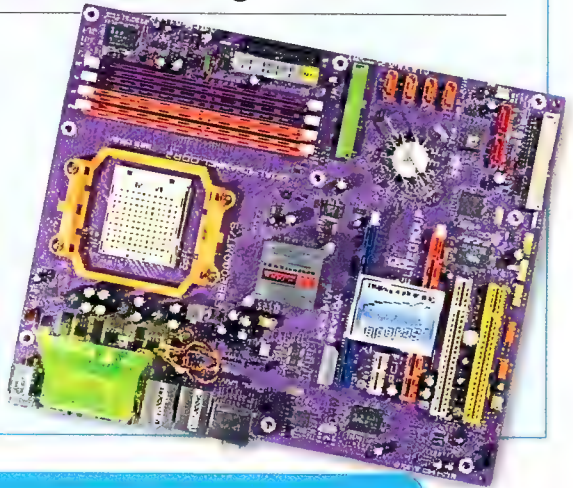
Chipset **3200 Express**; **PCI-E x16: 2**; **PCI-E x8: 0**; **PCI-E x4: 0**; **PCI-E x1: 1**; **PCI: 2** **HDMR: 0**; **E-SATA: 1**; **optical & coax SPDIF**; **1394A**; **serial**; **Realtek ALC883** sound; **Realtek RTL8139 & Agere ET-131x** Ethernet.

ECS is known as a 'budget' brand, so it's always interesting when they put out a board with a high-end chipset. Layout problems include two SATA ports being lost if you use a dual slot card and the world's worst PEG retention clips. A cheap looking shroud near the CPU socket shrinks down to a tiny fan, which actually stays surprisingly quiet, and blows outwards.

While there are dual Ethernet ports, one of them is only 10/100 and goes through the PCI bus, while the other does proper Gigabit through PCI-E. Two extra SATA ports are supplied through the JMicron JM363 controller, and one E-SATA passthrough bracket is included. A 3.5" bay is also included to convert the USB/Firewire bracket to fit the front of your case.

In short, excellent performance, but from a worryingly cheap feeling board.

17.5
OUT OF 10



ASROCK AM2NF4G-SATA2

Price **\$129** Supplier **Altech** Website **www.altech.com.au**

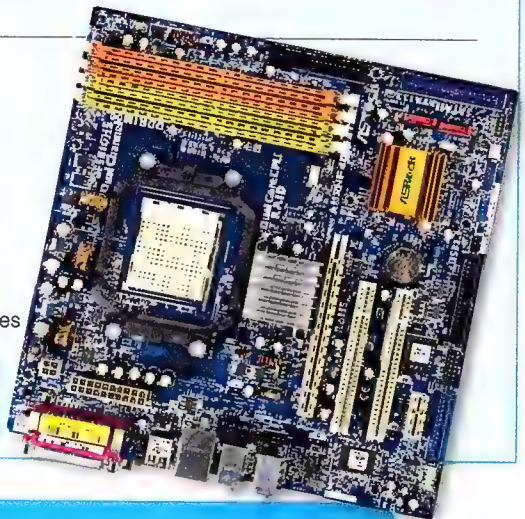
Chipset **GeForce 6100+410**; **PCI-E x16: 1**; **PCI-E x8: 0**; **PCI-E x4: 0**; **PCI-E x1: 1**; **PCI: 2** **HDMR: 1**; **E-SATA: 0**; **serial**; **Realtek ALC888** sound.

This micro ATX board has a nice amount of grunt, so long as you don't intend to overclock it. While it also features the FDD at the bottom of the board, its small size means there's less likely to be troubles with placing it there. An HDMR slot you'll never use sits next to it.

More likely to cause issues is the 20-pin power connector (yes 20) that sits behind the CPU socket, instead of somewhere more accessible. GeForce 6-level graphics are included onboard, but unless you're going to use this as a server or (as may be the case) for your parents, we recommend installing your own video card for some higher power DVI loving. The ASRock board also posted the lowest audio CPU utilisation scores in RightMark Audio 2.2, tying with the Gigabyte and averaging about two percent compared to everyone else's 10 percent.

A no frills board that will get you cheaply into the AM2 scene.

18.0
OUT OF 10



GIGABYTE GA-M55PLUS-S3G

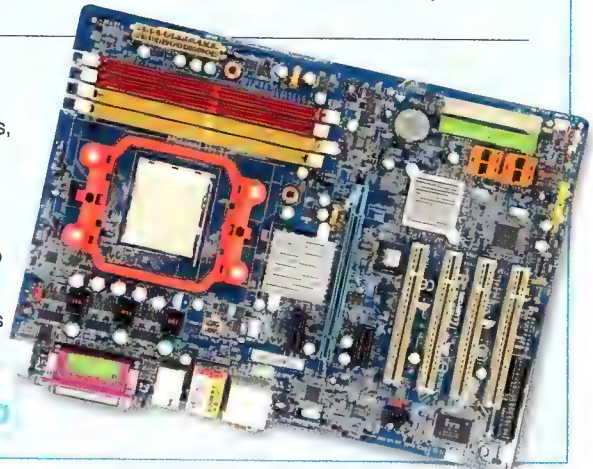
Price **\$170** Supplier **Gigabyte** Website **www.gigabyte.com.tw**

Chipset **GeForce 6100+430**; **PCI-E x16: 1**; **PCI-E x8: 0**; **PCI-E x4: 0**; **PCI-E x1: 2**; **PCI: 4** **HDMR: 0**; **E-SATA: 0**; **serial**; **Realtek ALC883** sound.

Slightly bigger than MSI's solution, Gigabyte's board is built for those that need to keep their legacy items, with four(!) PCI slots, a parallel and serial port, and inbuilt GeForce 6 video. Four SATA ports mean you can still have your modern hard drives, and the best PCI-E retention clip we've seen (take note other manufacturers) gives a good finish. There are few layout problems – yet again the FDD connector has been relegated to the bottom of the board, and particularly long PCI cards could knock out some of the SATA ports – cards placed in the first PCI-E x1 port may also have trouble rising above the passive heatsink sitting directly below it.

Try as we might, we just couldn't raise the M55plus' Sandra scores – nonetheless this didn't seem to affect the gaming scores at all, the board posting the highest result in the roundup. A good entry-level product from Gigabyte.

17.5
OUT OF 10



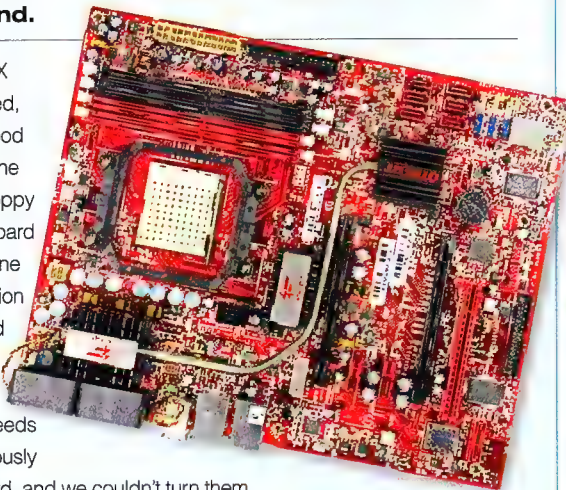
ABIT FATAL1TY AN9 32X

Price **\$330** Supplier **Altech** Website www.altech.com.au
 Chipset **nForce 590 SLI**; PCI-E x16: 2; PCI-E x8: 0; PCI-E x4: 0;
PCI-E x1: 2; PCI: 1 HDMR: 0; E-SATA: 0; Optical SPDIF; 1394A;
 Realtek ALC882D sound.

Certain models from the AN9 32X series have recently been recalled, so make sure you're getting a good one if you go ABIT. Once again the crazy insistence in putting the floppy connector at the bottom of the board rears its head. Solid capacitors line the CPU socket – a good indication of quality. Two small fans situated at the back of the board make quite a bit of noise, making us wonder if the heatpipe design needs work. Multiple red lights continuously flash from the bottom of the board, and we couldn't turn them off. A riser card for audio is included, but it's just a glorified Realtek chip.

The BIOS is a nice red, and has plenty of voltage options for the tweaker. A fan is included to bridge your cards should you have an SLI setup – whether or not this is an advantage depends on your case. PCI-E release catches are again stupidly on the heatsink side, and you'll have no luck fitting in an X-Fi if you have dual slot cards in SLI.

In the face of the options provided by Foxconn and ASUS, we don't know why you'd bother with the ABIT.



18.9 OUT OF 10

ASUS M2N32-SLI WIRELESS EDITION

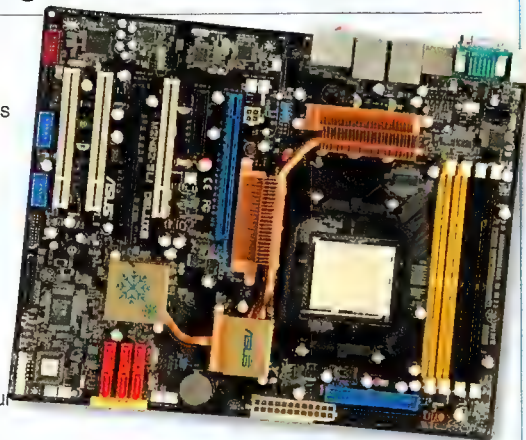
Price **\$380** Supplier **ASUS** Website www.asus.com.tw
 Chipset **nForce 590 SLI**; PCI-E x16: 2; PCI-E x8: 0; PCI-E x4:
1; PCI-E x1: 0; PCI: 3; HDMR: 0; E-SATA: 1; serial; optical and
 coax SPDIF; 1394A; 802.11g wireless; ADI1988B sound.

The only layout problem we found on the M2N32-SLI is that a second video card will cover two SATA ports – a problem solved by three of the six SATA cables included having right angle terminators. Puzzlingly ASUS has chosen the much less impressive ADI1988B sound chip over the common Realtek codec, meaning no hardware 3D sound. Three plastic extender blocks are included for the pin headers on your motherboard, two for USB and one for all the case connections. This means you should be able

to easily hook up everything from your case to the extender block, then hook the

block into the motherboard, making installations a breeze. Hallelujah!

A new BIOS gave access to a nice array of voltage and speed tweaks (although CPU voltage was sadly limited to only 1.5625V), and the BIOS even features an alarm that will play CD audio at a set time. A schmick package that's well worth the parted dollars.



19.5 OUT OF 10

FLEXIGLOW™ **NEW**

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Distributor: **BCSY V-NET** PTY Ltd. <http://www.bcsy.com.au>

<http://www.palit.com.tw> sales@palit.com.tw

Dell 2407 (Revision A02)

Craig Simms gets his sticky fingers all over Dell's updated wonder beast.

SPECIFICATIONS

Price \$1499
Supplier Dell
Website www.dell.com.au

Specifications 1920x1200;
6ms G2G; 16ms B2W; composite;
component; S-Video; D-Sub;
DVI; HDCP; 4-port USB hub;
6-in-1 card reader; swivel; tilt;
rotate; height adjustment.

The 2407 would have to be one of the most elusive monitors we've had to track down to date. Initially garnered with the A00 model, it was plagued with the now forum-famous text blurring and hideous gradient issues. Added to this the screen took a long time to turn on, meaning that you rarely got to see your machine POST.

A quick call to Dell to find out if this was normal operation resulted in the monitor being whisked away for further testing, and the review was withheld pending a response. Two months later we have revision A02, complete with new firmware, and thankfully those issues are now history, proving that yes, Dell does listen to its customers.

The first thing we noticed when placing the 2405 and 2407 side by side wasn't just the 3007WFP inspired metal stand – but the fact that at its highest extension the older 2405 sits a good 11cm above the 2407. This doesn't mean that the 2405 has a greater range – indeed at both monitors' lowest extension, the height difference remains unchanged, with the 2407's panel simply sitting closer to the desk. It is however a noticeable difference, with the higher reach of the 2405 feeling more comfortable to us tall folk.



Of course despite the design change, all the same panel adjustments remain – height, pivot, rotate and tilt are all there, keeping the Dell at the top of the food chain in terms of adjustability.

The buttons along the fascia are larger than its predecessor and almost sit flush, however they are now considerably more difficult to press. The menu they operate has also been revamped – but while it looks impressive enough, it is a pain to navigate and is counter-intuitive, particularly when you're darting about the different subsections altering the settings to suit your needs.

Inputs have remained unchanged, still providing VGA, DVI, component, composite and S-Video, as well as a refined card reader on the side and the four USB ports – this is still very much a convergent media panel.

Usability improvements are a mixed bag – an image now appears in the top left of the screen when an input is detected, which is neither here nor there, however annoyingly Dell has joined the 'preset' crowd, now offering 'desktop', 'multimedia' and 'gaming' modes. Desktop is what you'll want to keep it on to avoid the previously mentioned gradient issues, as the Faroudja video processing has been turned off for this mode in the new firmware.

The preset mentality has further crept into the colour settings, where you can now choose from 'Mac' or 'PC' mode (presumably just temperature settings), as well as the previous sub menus of Normal (sRGB, we assume, but the monitor doesn't tell us this), Blue, Red and Custom.

DisplayMate performance is now flawless, with visual clarity on par with the 2405, displaying the full greyscale range of one to 255, and still with the most impressive colour ramps we've seen. Blacks appear significantly better.

Gaming is where it's at for this monitor though, and we can report that the refresh rate is markedly better than its predecessor, meaning large, acceptable widescreen gaming is now in the realm of the possible.

Unfortunately there still seem to be a few



issues with the 2407 – for one, the component inputs simply wouldn't work with our Xbox 360, while others have found the contrast to be simply too high compared to when the console is hooked up through composite. When we swapped the 360 over for the local MediaGate however, the components worked fine – meaning that there may be a little work to be done on the compatibility side.

There have also been complaints about vertical gradients not being interpreted correctly, and after going through several different variations of vertical gradients we were finally able to replicate the problem with one particular example through the DVI connector – pronounced banding and a slight tinge of green and purple were present in the greyscale gradient compared to both the VGA input and the 2405. Hopefully the A03 will see the light of day soon to rectify both issues.

We can now happily call the 2407 a good monitor in its A02 revision, especially for those who want large, widescreen PC gaming bliss, and don't mind sacrificing a teensy bit of image quality – but for us, until it fixes the aforementioned issues it fails to reach the heights of its predecessor.

SCORE
8.0
OUT OF 10

Lian-Li PC-V300

Craig Simms checks out Lian-Li's go at a home theatre case.

SPECIFICATION

Price **\$269**
Supplier **Anyware**
Website **www.anyware.com.au**

Specifications **4x 5.25" bays; 2x 3.5" bays; 2x front USB ports; 1x Firewire port; headphone/microphone; removable motherboard tray.**

The moment we clapped eyes on this aluminium beauteous case we knew we had to get it in for review. Bill, our designer, turned his head when it arrived and his eyes lit up, meaning either he liked it, or the cardboard box got a bit wet and he was looking for somewhere else to live. We assume the former.

Casualy straddling the fence between mini-server box and HTPC, the PC-V300 measures 351mm (D) x 285mm (W) x 242mm (H). Obviously this means it can only fit micro ATX boards, rather than full-sized ones, however for everything else you can happily use standard sized parts, even the power supply. Those with full length video cards like the X1900XT, 7900GTX and 7900GT will have trouble though – and if you must have the case and a full length card, then be prepared to hacksaw one of the drive bays off to accommodate.

Clearly it's not your standard HTPC box as the form factor is far too cube-like to fit the bill. However it does look somewhat like an attractive aluminium speaker, and so wouldn't look entirely out of place among the rest of your AV equipment. One could even say Lian-Li has pioneered a new form factor – the 'media' box, something that happily has enough storage for all your *Lost* episodes, but is still small, and works both angles aesthetically.

A single black strip down the middle features nothing but a power and reset button, in what is now a common Apple-inspired element across all Lian-Li cases. Which is more than fair,

considering how much the G5 case borrowed from Lian-Li.

Disappointingly the front is equipped with two 80mm fans, as well as one on the side – fortunately these aren't too loud, but we'd gladly have had a slightly bigger case for a triumvirate of 120s. The perforated front, although looking nice, won't do it any favours for noise either.

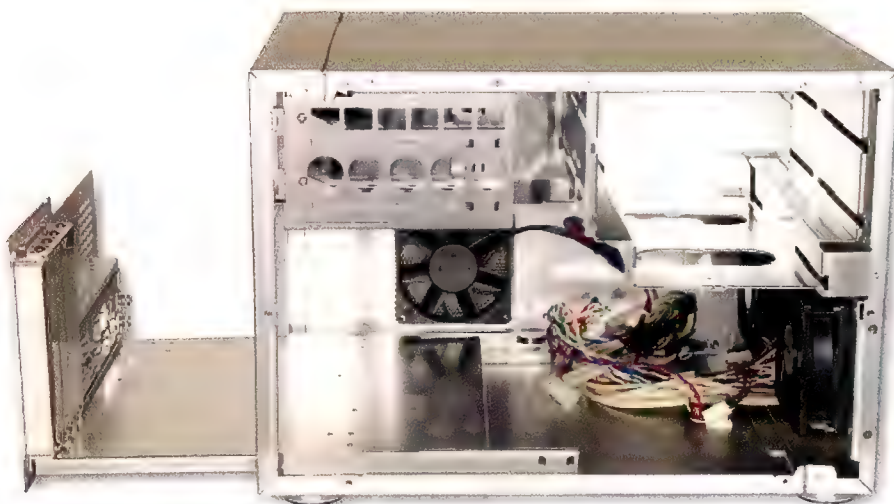
Drive wise there's some interesting innovations. An external 3.5" and two 5.25" bays are featured on both sides rather than on the front – meaning you can kick the box against any corner and still easily access your drives. Sadly you have to pick one side or the

other, as the opposite sides are connected via a single tray, meaning there's only enough width for one drive per bay level.

A further two internal 3.5" bays sit at the back above the motherboard backplane, complete with quick release rails – mind you, this is also a bugger to access due to it being blocked off by a grill secured by four screws. In fact it's surprising how many screws are on here considering Lian-Li pretty much pioneered the screwless approach.

The case features a removable motherboard tray, and unlike most other cases you'll actually need to use it as there's no other way to get the darn thing in. Removing the side panels is a pain, with six screws needing to be removed to get access – which you will likely need to do to insert your drives. The usual assortment of USB, Firewire and audio jacks line the front.

The PC-V300 is a pretty darn nice case, but a few flaws keep it from greatness. We look forward to the next revision, where no doubt Lian-Li will get it just right. For now if you're not too bothered by the inconveniences and love the aesthetics, it will do nicely in any lounge room next to a massive LCD TV. It's just that damn pretty.



SCORE **8.0**
OUT OF 10

Swiftech H2O-220-T Thermoelectric

Price \$750

Supplier PC Case Gear

Website www.pccasegear.com.au

Specifications Thermoelectric system for Socket 939 (others via kits); brass and copper radiator; two 120mm fans

The thing about this thermoelectric cooling system is that one needs to be richer than that special kind of doctor that arrives via parachute from a helicopter, strips away his flight jacket and attachments to reveal the lab coat, strides casually in, announces his patient has a cough, then calmly rolls into his Aston Martin driven by a bikini model and revs off into the sunset. The hardcore will seemingly pay anything to get at a damn good widget, so the question that simultaneously screams for both an answer and your children's kidneys, requires a tad more deliberation.

For a cooling system priced this high, one might expect God-like performance. Whacking it on Chernobyl at 80W, it spat out a marvellous 10°C in an already cool ambient 21°C. It is indeed almighty and God-like.

However, from such an obscenely expensive unit we expected some small luxuries, such as a fine-leather-bound manual and an easy to install retention mechanism. Perhaps, also, the

manual could be sealed by the utterly awesome meta-lips of Angelina Jolie.

Not even slightly. Toss all luxuries and psychotic fantasies out the door, screaming and on fire. Installation is meticulously heavy duty, involving a power drill, grease, acrylic lacquer, cutting tubes, concocting up a coolant mixture and finally piecing the monster together. Quite the valiant effort.

Where did all the money go? We were left wondering, as it lacked all forms of articulate design. We have arrived at a theory; it is probably entirely within the carefully-placed staple that binds all 16 pages of the photocopied manual.

One observation is clear; this is the bitching Juggernaut of all that is cooling. If you can flippantly slap this on your shopping list, temperatures will grovel at your feet, as will your bank account.



SCORE 9.0 OUT OF 10

SWIFTECH H2O-220-T

Pertelian X2040

Price \$79

Supplier Cool PC

Website www.coolpc.com.au

Specifications Hitachi HD44780 based LCD; 20x4 green backlit LCD; USB connection; plugin support.

Because the world can never have enough LCD displays, ForeSight Systems has had the, err, foresight to gift us with the Pertelian.

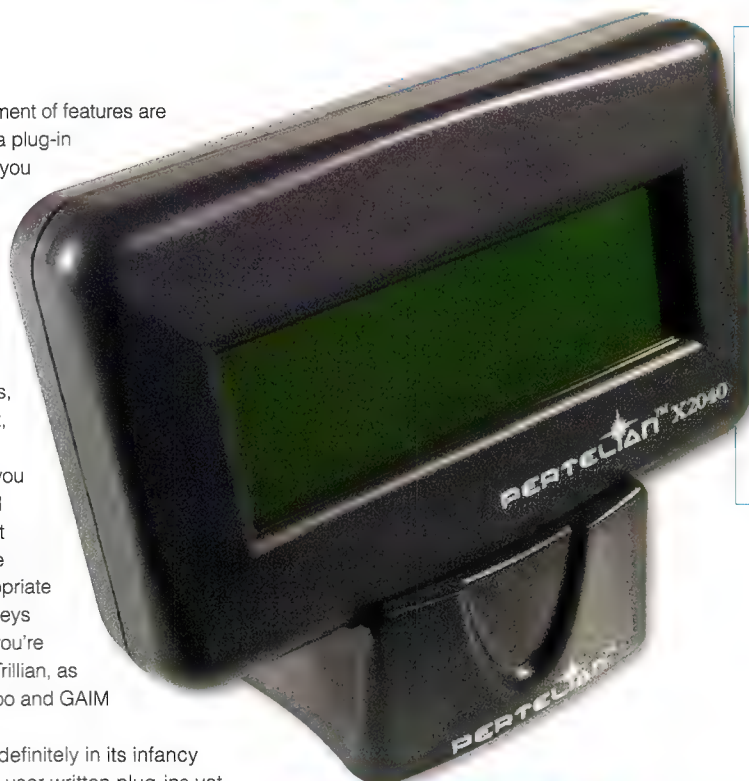
A twenty column, four-row display, the Pertelian connects through USB and can hook into the handily provided stand or attach anywhere via the included Velcro strip.

The screen supports scrolling, the roll-over separated by a pre-defined character, and the speed of the scroll is adjustable, although thanks to the response of the screen it can be hard to follow the text at high speeds.

There are a number of customisable hotkeys used to control the screen, although unfortunately the software does not recognise the Windows key as a valid shift, only as a final character in the hotkey. We couldn't help but feel some physical buttons on the unit would be a lot nicer to use than a bunch of hotkeys, especially when said keys could affect your gaming experience. This would also make the menus and option trees on the Pertelian quantifiably easier to navigate.

The usual assortment of features are supported through a plug-in style interface (and you can write your own if you're familiar with .NET 2.0) – email, weather, RSS, Winamp/iTunes/WMP control, volume control, system stats, Teamspeak support, stocks, and as an interesting add-on you can keep notes and not only read instant messages, but write back with the appropriate combination of hotkeys – providing the IM you're using isn't MSN or Trillian, as only AIM, ICQ, Yahoo and GAIM are featured.

The Pertelian is definitely in its infancy (with seemingly no user-written plug-ins yet available), but development is moving along at a rapid pace, feature sets are expanding quickly and the future looks promising. Throw in a better screen and navigation buttons and you have a winner.



SCORE 7.0 OUT OF 10

PERTELIAN X2040

Thermaltake Matrix

SPECS

Price \$TBA
Supplier Thermaltake
Website www.thermaltake.com
Specifications Midi tower; 4x HDD bays; 2x FDD bays; 4x 5.25" bays; 120mm rear fan; removable face plate.

For a steel case the Matrix sure is light. Its starkly utilitarian design may be a turn off for some, but it does come with something we wish all modern manufacturers would include – a soft cloth to wipe fingerprints off the black exterior!

Inside the Matrix (woah) there are four 5.25", four 3.5" HDD bays and two 3.5" external floppy bays – unlike other cases, the mounting holes drilled restrict you to the old technology, meaning you lose valuable potential HDD space.

Like most cases these days, it's tool-less, with two ginormous thumbscrews attached to the case door that already has double quick release handles built in. If you're security conscience, it also comes with a lock on one of the handles, although we think people are more likely to take the entire case rather than its innards. Also featured on the door are grid punched vent holes, and a second set of vent holes supplied to mount an exhaust fan over your CPU. Don't buy this one if you want silence, folks.

The drive bays are also quick release, as are the PCI slots, which are removable.

The drive bay mechanisms are an interesting breed – a knob on the outside is attached to a toothed plastic disc on the other side of the drive bay, and must be twisted to allow the disc to exit through a keyhole. While it certainly holds your drives solidly, it can be a pain to fit the disc into the keyhole due to the mechanism's free spinning nature, and you can't help but get the feeling that the plastic could be easily damaged, resulting in a useless clip. Similarly, the 5.25" drive bay covers are not the most stunningly engineered pieces, so don't expect them to take much punishment.

Speaking of removables, the motherboard tray is not – expect to build your system in situ.

A single 120mm fan is mounted at the back, and while it isn't the quietest we've heard, it's certainly passable. Refreshingly, it doesn't glow burn-out-your-eyes blue. There's also no fan mounted in front of the hard drive bays, although there is the space to insert one if you wish.

The front meshed face is removable if you need to clean it, and on the bottom right front side (that's four directions in a row folks!) features

the obligatory USB, Firewire, headphone and microphone jacks.

The Matrix is nothing special – it's there to do the job of holding your bits. There's nothing that wrong with it, it's simply not exciting.

CS



SCORE **6.5** OUT OF 10

Thermaltake Toughpower 750W

SPECS

Price \$269
Supplier Thermaltake
Website www.thermaltake.com
Specifications 750W; 20/24 pin power; 8/4pin 12V power; 8x molex; 1x FDD; 6x SATA; 2x PCI-E; modular.

Thermaltake's Toughpower series is really starting to challenge the heavyweights, now coming in at a mind boggling 750W – you'd need a lot of hard drives to justify such a huge amount of power (or maybe some old style quad SLI), but we *know* that there are people out there who need it. Heck, we are such people.

Fortunately for us, the price hasn't followed the power increase, coming in a good whack lower than its competitor Silverstone.

Four 12V rails provide a large bulk of the power from the black shine-finished box, and the single positively-monstrous 140mm fan – while not matching Seasonic's marvellous volume levels – manages to stay quiet enough that the noise generated will disappear altogether once mounted in a case.

A siliceous mold is even included to sit between where the power supply is mounted to the case, cutting down on vibrations. Two thumbs up for Thermaltake there.

The modular system is as always welcome,

however we would have hoped for jacks which differed more obviously (such as Hiper's), rather than us relying on the labels and slowing down the process. Nonetheless the system works well, and the modular cables supplied are an excellent length.

Throwing it into our standard AMD test bench, the Toughpower pulled 3.34V, 5.12V and 12.12V on the 3.3V, 5V and 12V rails respectively. Loading up 3DMark at insane settings to strain the system, the Toughpower laughed at as, throwing load values of 3.33V, 5.11V and 12.11V.

If you're in the market for a lot of power, you could do a lot worse than picking up one of these behemoths.

It even comes with a poorly translated slogan, 'Toughpower – The Independent Voltage Output', the second best slogan we've seen this year, after 'Coolall Your Eyes', another Thermaltake special. What more could you want?

CS



SCORE **8.0** OUT OF 10

Cool-Trek Vostok

Price **\$199**

Supplier **Cool-Trek**

Website **www.cool-trek.com**

Specifications **Socket 939, 754,**

940, A, 775, 478, 603, 604;

copper-based water block;

radiator; 1700rpm 120mm fan

Sounding distinctly Russian, the Vostok is yet another in a long line of DIY water-cooling kits for your CPU.

As usual, mounting the waterblock requires removing the default retention bracket and replacing it with the custom solution – in this case the waterblock is placed on the CPU, with a mounting plate placed on top and screwed through the motherboard to hold the waterblock down.

Construction is a cinch for watercooling veterans – newbies may be a bit thrown by the inclusion of only one pipe, which needs to be cut to appropriate lengths. They may

be similarly thrown by the instructions, which while nicely coloured, fail to mention where all the pipes need to be attached. Once again not a problem for those already familiar with such systems, but those trying to get into water-


cooling may find it a barrier.

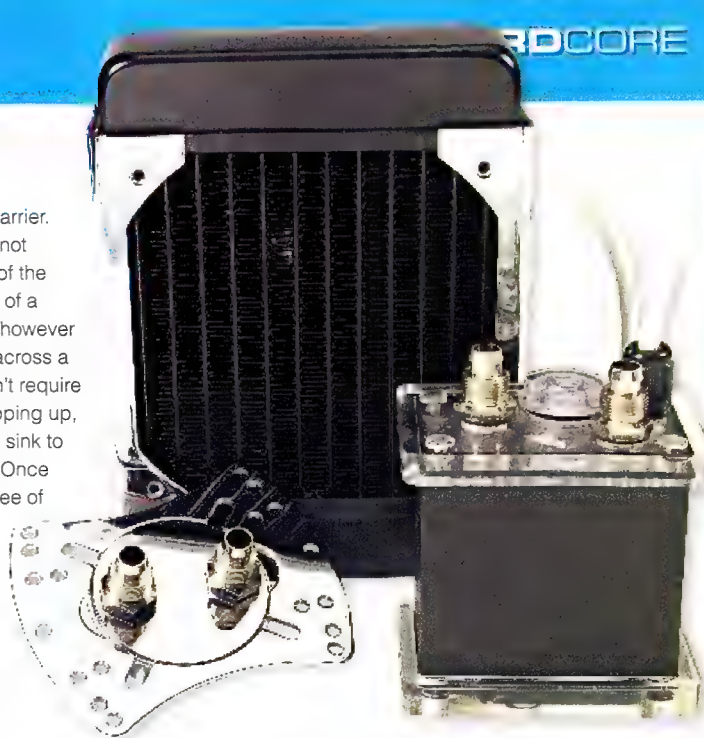
As usual the filling (not to mention emptying) of the circuit is nothing short of a pain in the reservoir – however we have yet to come across a DIY system that doesn't require the initial continual topping up, or thirty minutes in the sink to empty the darn thing. Once the circuit is full and free of air, the Vostok hums along very quietly, observing one of the tenets of good watercooling.

Unlike other systems, coolant isn't included, only a red additive to make water less corrosive. The opening through which the reservoir is filled is annoyingly tiny, and difficult to get to considering it is placed between two hose attachments and the power lead for the pump.

Strapping the newly connected system to the mighty Chernobyl and letting it run for a while before turning the dial up to the requisite 80W, it managed an impressive 28°C in an ambient

temperature of 19°C – whew!

If you don't mind going through the rigours of setting up a watercooling rig, it's hard to see you going wrong with the Vostok. 



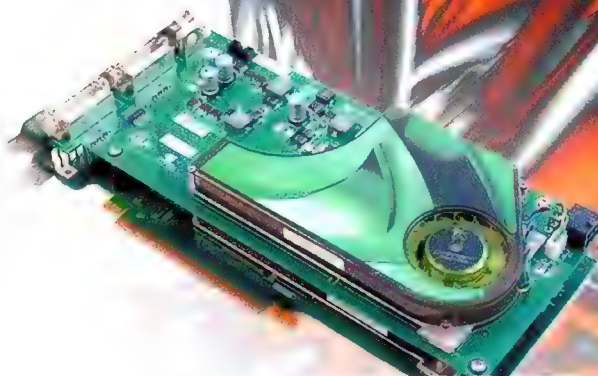
COOL-TREK VOSTOK



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**All new 7950GX2
Dual GPU for superfast gaming**



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Our choice for
the best gear the
land has to offer

There's nothing sexier than new kit. And whether you need to horde your pennies (Budget), want the most power for your dollar (Performance) or own a small mansion and

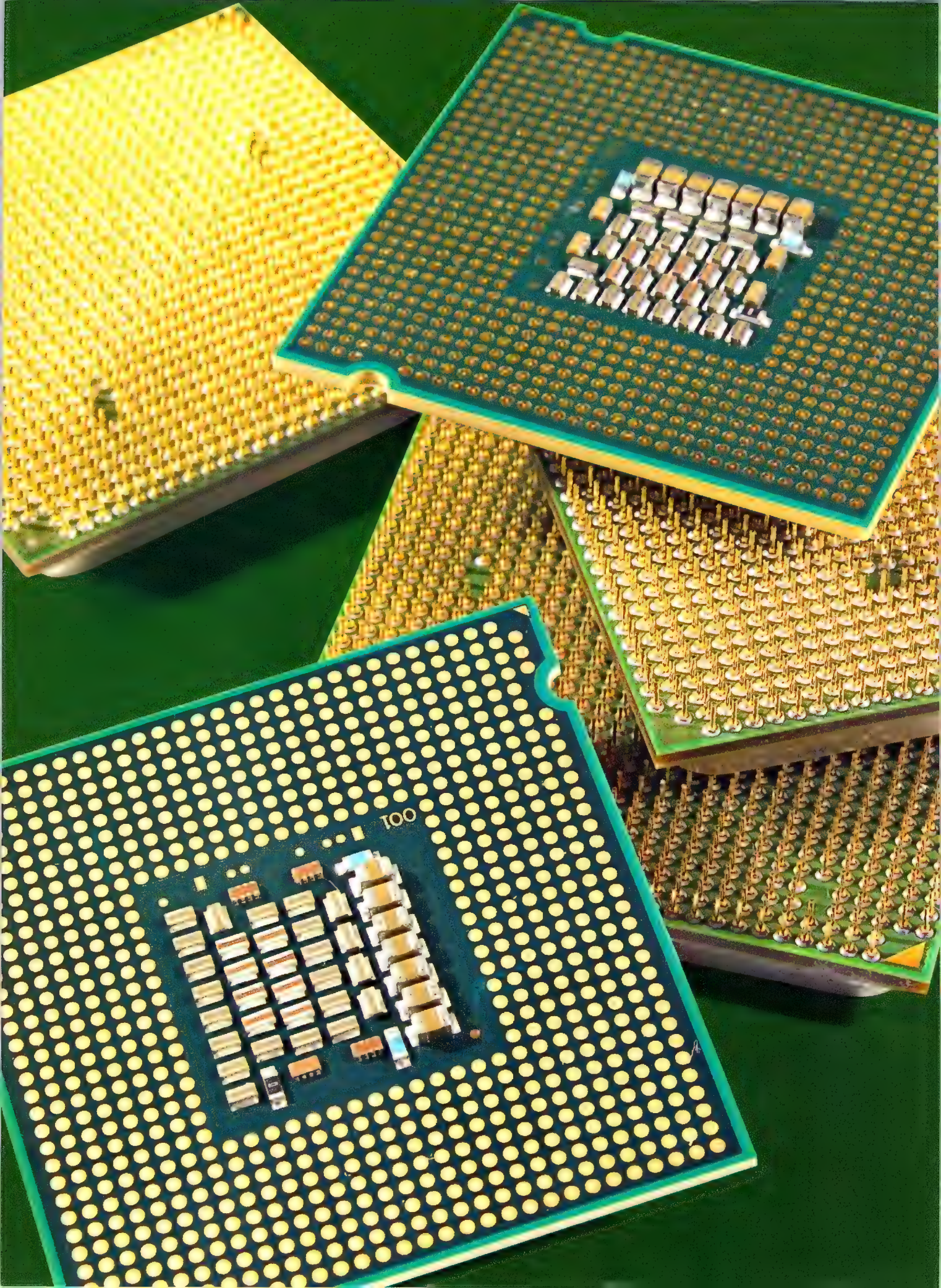
a collection of sports cars (Extreme), we're here to help with this handy matrix of *Atomic* recommended products. You may find your needs fall between categories – that's okay,

just mix and match to suit your budget! Each piece of kit has been reviewed hands-on in *Atomic*, so if you want to learn more look up the issue and page number listed.

	CPUs	Motherboard	Memory	Video card
BUDGET <i>I can't afford to eat... gimme gear!</i>	intel  Intel Pentium 4 6xx Series PRICE \$280-660 Single core isn't dead yet, and the Intel 630 can be had for less than 300 smackaroos, satiating those on a shoestring.	 ECS RS400-A PRICE \$189 This budget board uses the RADEON Xpress 200 chipset, offering a perfect 'in between' stage for those who need to upgrade slowly. Reviewed in Issue 57 – Page 40	 2x512MB PQI Turbo PC2-4200 PRICE \$160 If you can't afford the 2GB, stick with 2x 512 to get your dual channel bonus. Reviewed in Issue 59 – Page 39	 Sapphire X1800GTO PRICE \$380 The crazy amount of punch delivered by this card is worth stretching your budget a little. Viva la RADEON! Reviewed in Issue 66 – Page 33
	AMD  AMD Athlon 64 Series PRICE \$190-250 If you can't afford dual core or don't see the point, the 3800+ Venice has quite a kick left in it at about \$230.	 Gigabyte GA-K8VT890-9 PRICE \$139 Sporting VIA's K8T890 chipset, this board is perfect for the budget conscious but still packs a powerful punch. Reviewed in Issue 54 – Page 55	 G.Skill ZX Value DDR PRICE \$169 1GB is the bare minimum you'll get away with these days – stick these in for some decent grunt. Reviewed in Issue 58 – Page 44	
PERFORMANCE <i>Hardware that bangs the best per buck.</i>	intel  Intel Pentium D Series PRICE \$180-520 Yummy goodness in an Intel wrapper. The Presler cored 940 is the best value currently at about \$320, and should be able to stretch its legs in the OC stakes.	 ASUS P5N32-SLI DELUXE PRICE \$360 It doesn't get better than NVIDIA's new SLI x16 platform and dual-heat-pipe cooling for the Pentium. Reviewed in Issue 59 – Page 45	 2x1GB PQI Turbo PC2-4200 PRICE \$300 PQI understands value, fortunately for us they also understand performance. Reviewed in Issue 59 – Page 39	 NVIDIA GeForce 7900GT PRICE \$450 In the face of stiff competition from the much cheaper X1800GTO, the 7900 wins out purely because of the strength of the SLI platform. Reviewed in Issue 64 – Page 40
	AMD  AMD Athlon 64 X2 Series PRICE \$265-470 Burning speed with an attractive price tag, the 3800+ is currently your sweet spot at around \$265, and should overclock that extra mile you require.	 ASUS A8N SLI PREMIUM PRICE \$315 This Crossfire mobo packs high quality ASUS design and affordability into one bundle. Reviewed in Issue 56 – Page 41	 2x1GB PQI Turbo PC3200 PRICE \$360 The PQIs impressed with their overclocking potential and low cost. Reviewed in Issue 59 – Page 38	
EXTREME <i>Gimme power. Money is no object.</i>	intel  Intel Pentium 955 EE PRICE \$1700 Dual core is the future, and the future is inside this smoking chip with high overclocking potential. Reviewed in Issue 61 – Page 35	 Gigabyte GA-1975X PRICE \$360 The 955EE and Crossfire have never been more at home. Plus turbojet wind tunnels! Reviewed in Issue 62 – Page 39	 2x1GB Geil PC2-5300 Ultra PRICE \$470 The Geils screamed through our lab tests, proving their dominance for the Intel platform. Reviewed in Issue 59 – Page 39	 X1900XT Crossfire PRICE \$650x2 If you can find a Crossfire Edition card, pair it up with a standard XT for max speed. Reviewed in Issue 62 – Page 37
	AMD  AMD Athlon 64 FX-60 PRICE \$1700 Unlocked multipliers and hot dual-core lovin' means joy. You can't go past the FX-60. Reviewed in Issue 61 – Page 35	 ASUS A8R32-MVP Deluxe PRICE \$320 Back in black, ASUS rocks the house with dual PCI-E x16 slots for Crossfire. Reviewed in Issue 63 – Page 35	 2x1GB OCZ PC4000 EB Platinum PRICE \$500 OCZ provides quality products for the hardcore – and this time is no different. Reviewed in Issue 59 – Page 38	

Looking for your next AMD AM2 or Core 2 Duo-based platform? Never fear, prepare for next month's revamped Kitlog where you'll be able to read our recommendations for the best AMD and Intel systems, with parts we've tested ourselves!

Cooler	System drive	Display	Speakers	Case
 <p>Thermaltake Golden Orb II PRICE \$49</p> <p>For such a large and effective heatsink the price is hard to beat. It's low profile too, so should fit in all sorts of cases.</p> <p>Reviewed in Issue 58 – Page 37</p>	 <p>Seagate Barracuda 120GB PRICE \$120</p> <p>These 120GB drives are fast and sweet, and yet the price is right at around a dollar per GB.</p> <p>Reviewed in Issue 53 – Page 41</p>	 <p>BenQ FP71V+ PRICE \$490</p> <p>This 5ms 17in LCD is cheap and speedy, and plenty good enough for even the most fussy of grandmas. Send her your love today!</p> <p>Reviewed in Issue 54 – Page 48</p>	 <p>KOSS SB40 PRICE \$110</p> <p>You'll find that these circumaural boomers will do you justice just fine if you can't afford a THX 7.1 platinum plated surround sound setup.</p> <p>Reviewed in Issue 38 – Page 30</p>	 <p>Cooler Master Ammo 533 PRICE \$115</p> <p>Perfect for LANs with its heavy duty handle, military styling and rugged construction, the Ammo blasts the budget competition away.</p> <p>Reviewed in Issue 60 – Page 50</p>
 <p>Thermalright XP-90C PRICE \$99</p> <p>Thermalright built their business around effective coolers, and the XP-90C is one of the best money can buy. It looks sleek too!</p> <p>Reviewed in Issue 58 – Page 33</p>	 <p>Seagate Barracuda 7200.10 750GB PRICE \$980</p> <p>Seagate's fancy new technology makes this beast both fat and fast. We're almost at 1TB!</p> <p>Reviewed in Issue 66 – Page 43</p>	 <p>Samsung 930BF PRICE \$650</p> <p>Clocking in at 4ms, this gorgeous 19in screen has a colour depth and tonal range that will make you weep with joy.</p> <p>Reviewed in Issue 61 – Page 46</p>	 <p>Altec Lansing MX5021 PRICE \$300</p> <p>This 2.1 set is for those after a decent yet simple setup. The next best thing before 5.1 sound.</p> <p>Reviewed in Issue 47 – Page 85</p>	 <p>Cooler Master Stacker 830 PRICE \$335</p> <p>Like the Stacker before it, this sensational Stacker stacks sumptuous specifications successfully.</p> <p>Reviewed in Issue 61 – Page 36</p>
 <p>Asetek Vapochill Lightspeed PRICE \$1129</p> <p>Vapour phase change. Ooooh. Vapour. Phase. Change. No matter how many times you say it, it's still cool (pun!)</p> <p>Reviewed in Issue 64 – Page 38</p>	 <p>Western Digital Raptor WD1500ADFD PRICE \$460x2</p> <p>Dear lord. The performance king hath cometh, short of whacking in a SCSI. Buy two and RAID 'em.</p> <p>Reviewed in Issue 62 – Page 40</p>	 <p>Dell 3007 WFP PRICE \$2899</p> <p>Thirty inches. 2560x1600. 11ms G2G. If you can handle the size and cost to run this massive beauty, you won't be disappointed.</p> <p>Reviewed in Issue 61 – Page 49</p>	 <p>Logitech Z-5500D PRICE \$600</p> <p>Able to play the 'liquid gold' that is DTS 96kHz/24-bit, this 5.1 beast can wreck both home and hearing alike with equal impunity.</p> <p>Reviewed in Issue 48 – Page 56</p>	 <p>Lian-Li PC-S80 PRICE \$499</p> <p>The PC-S80 must have been designed by an ear-muff wearing design dude as it not only looks sleek and cools well, but it's super quiet to boot.</p> <p>Reviewed in Issue 66 – Page 41</p>



INTEL STRIKES BACK

Will AMD survive the powerful blow that is Intel's Conroe? **Craig Simms** adjudicates.

Intel's back. That's the message we've been hearing for some time now, after the numbers coming back from the last Intel Developer Forum (IDF) claimed that Conroe outperformed AMD's counterparts by 20 percent in certain applications. We could stop laughing. Intel fan boys could start holding their heads high again. The drought was over.

Of course there were warning signs. Its predecessor, Core Duo, was doing wonders in the mobile field, already shaming desktop processors with ease, as shown in our Dell XPS M1710 review (*Issue 65, page 40*).

Since then the marketing droids have seen fit to rename Intel's messiah to Core 2 Duo (Twin Pair Binary Couple Doublet Dyad Deuce Tautology Edition). With the Pentium name finally gone forever, the onslaught is here, ranging from 1.86GHz through to 2.93GHz.

So why is Intel smiling more than Molly Meldrum after three curries and thirty schooners of black? Let's pop the hood and see what's changed architecturally with Intel's comeback kid.

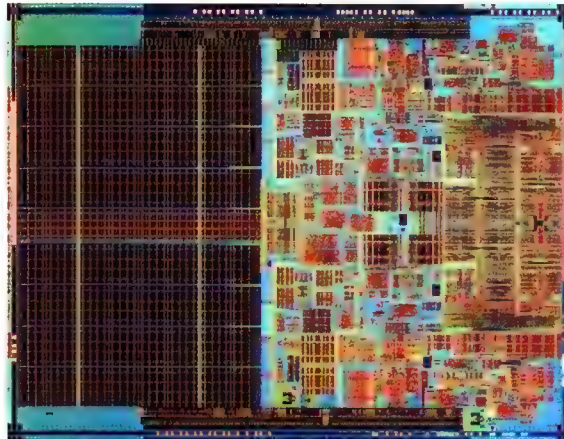
LEARNING LESSONS

Let's not muck around – a lot of Intel's gains have occurred by looking at how AMD stole the performance crown, and following its ideals. Or perhaps it's more accurate to say Intel finally gave up on Netburst, and followed what worked with the Pentium III. Either way, it's mighty fine. Gone is the deep pipeline that plagued the Pentium 4, with Core 2 dropping the number of stages from 31 to 14, just two instructions deeper than the Athlon 64. The L2 cache is now shared between cores.

Intel is also talking up its reduced power consumption, right down to 65W Thermal Design Point (TDP). Mind you, the way it measures this is remarkably different to AMD's (AMD takes all parts running at maximum load; Intel takes what it believes to be an average loading), so take this with a grain of salt. With this in mind, the FX-62 runs at a claimed 120W TDP, which is a good 40W more than Intel's Extreme Edition X6800, its current top of the line. X6800? Someone headhunt the marketeers from ATI and NVIDIA?

Efficiency, performance per watt and instructions per clock are now buzzwords, a language AMD was speaking long ago. Dare we say it – Intel is the new AMD.

It's not all sugar and honey though – even if Core 2 is still Socket 775 and the 975X is still considered king of the hill in motherboard chipsets, unless you purchased recently, it's likely you'll need a new board to go from blunder to wonder chip.



Conroe has had just a bit of a redesign. The two cores now share the one cache, reducing the number of cache misses thanks to the bigger playing field. AMD's been doing it for years.

BENCHMARKING

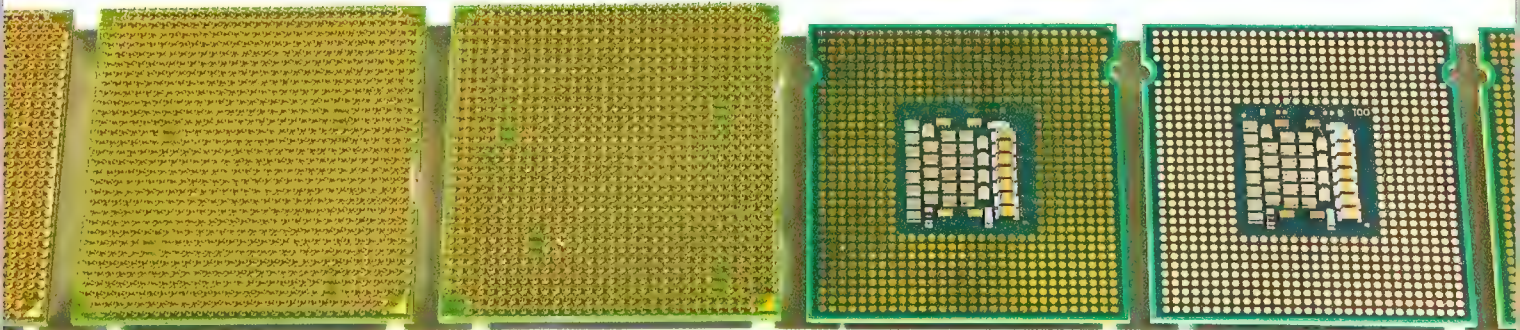
As is always the case with a 'new' microarchitecture, a few extra marketing terms that everyone will forget within a year have come along with it – so let's wade through some of the terms that Intel is claiming are responsible for giving it the advantage.

WIDE DYNAMIC EXECUTION

Core 2 has wider execution cores than the Pentium 4 and the Athlon 64, meaning four instructions can be dealt with at once rather than three. The dynamic bit refers to enhancements to the out-of-order execution and branch prediction engines, with Core 2 featuring 96 instructions over the 64 of the original Core Duo.

OVERCLOCKING

While we only had a little time to play around with overclocking, we did get some good results. The P965 simply didn't want to know us, but then it was a pre-production board. Our 975X reference board on the other hand just grinned and opened up the throttle on our E6700, happily ramping up to 3.3GHz stable, whooshing past the Extreme Edition and trampling AMD even further. We're really looking forward to seeing what ATI's chipset can do – assuming ATI continues to support Intel chips.



MACRO FUSION

This allows combined pairs of instructions in the pipeline to be treated as if they were one instruction, meaning one instruction per clock instead of two. It's all about efficiency, folks.

INTELLIGENT POWER CAPABILITY

Intel is now able to power down areas of the CPU even more selectively, so that only the individual logic subsystems that are required are drawing current – cutting power, and as a result heat.

ADVANCED SMART CACHE

Intel's fancy name for 'both cores access the one cache'. Also known as 'about bloody time'. By giving the cores access to a larger pool, the amount of data look-up misses can be reduced. There's no arbitration process – both cores just grab what they can.

SMART MEMORY ACCESS

Also called Memory Disambiguation, which is simply prediction – rather than waiting for all the store operations to finish before loading up the next data from system memory into the execution core, Core 2 speculates what the next data it receives is going to be, and lines that up in the execution core, getting ready to store when it can. It makes use of the previously empty execution core while it waits for the store process to finish, and therefore saves on execution time. Of course if it's wrong, then the data is simply reloaded from main memory.

ADVANCED DIGITAL MEDIA BOOST

Ugh, marketing. Yes, I sure do want to boost my digital media in an advanced manner.

To those who prefer tech speak, this simply means that Core 2 is able to handle a full 128-bit SSE instruction per clock, rather than one every two clocks as was the case in previous generation Intel chips.

SPEC ME UP, SCOTTY

Core 2 is a 65nm part, and all parts available to date will have 2MB of L2 cache, with the exception of the E6700 and X6800, which will double this to 4MB. EM64T is along for the ride, meaning 64-bit operating systems are a go. Unlike the last set for which a 1066MHz front side bus (FSB) was limited to the Extreme Editions, most Core 2 Duos will run at this FSB, with only the lowest E4200 running at 800MHz. In the server space, this will likely hit 1333MHz.

For the first time, the one microarchitecture will be aimed at all three market segments – Portable (Merom), Desktop (Conroe) and Server (Woodcrest). Expect to see the Core name quite a lot in the future. We should start seeing Merom-based laptops in a month or so.

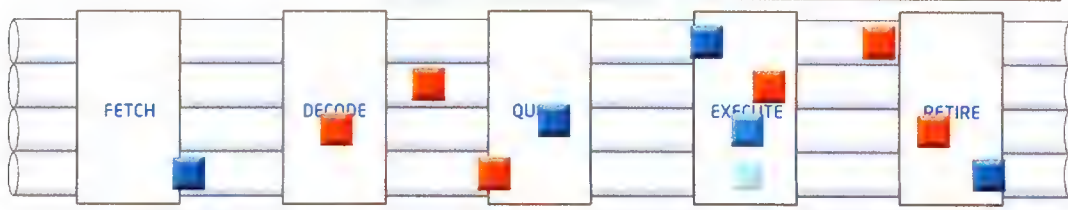
Oh, and as far as the Extreme Edition is concerned, there's no HyperThreading, and just like its predecessor it will only

'Advanced Smart Cache. Intel's fancy name for "both cores can access the one cache". Also known as "about bloody time".'

WITHOUT INTEL® WIDE DYNAMIC EXECUTION

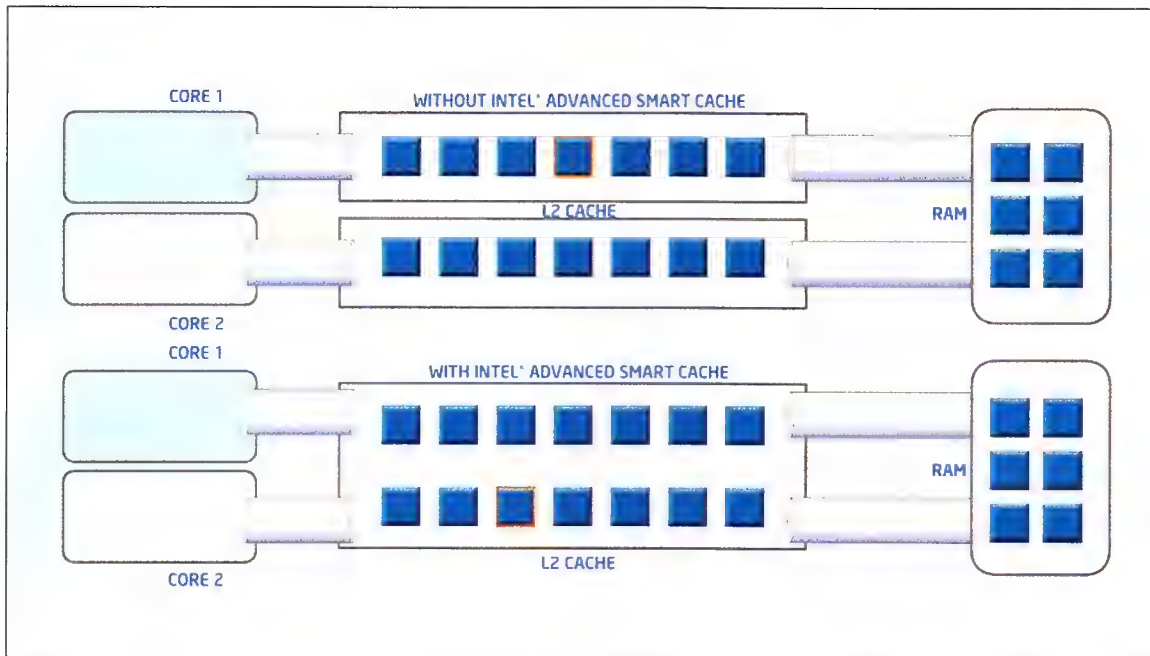


WITH INTEL® WIDE DYNAMIC EXECUTION



Core 2 Duo's execution cores now have four pipelines to play with, over the three of past architectures.

The cores now fight over a shared cache, rather than having their own, smaller, dedicated cache. The increased available cache means there's less chance of a cache miss, meaning the CPU has to go back to the RAM less often.



work on the 975X chipset. But it is multiplier unlocked. Hurrah!

Then there's quad core, with the Server (Kentsfield) and Desktop (Clovertown) parts now expected to arrive from Intel before the year's end, even though the official word is still Q1 2007. These however seem like interim parts, introduced just to get the jump on AMD – as they are essentially just two dual cores on the one die, with the cache not shared between the pair.

THE TESTING: IN THE BLUE CORNER

An Intel Core 2 Duo X6800 and E6700, matched up on

a 975X reference board and Gigabyte's top of the line P965 board, the GA-965P-DQ6. Corsair 4-4-4-12 800MHz RAM clocked at 667MHz in the 975X and 800MHz in the P965 was used. An Albatron 7900GT video card performed the graphics duties.

THE TESTING: IN THE GREEN CORNER

An AMD FX-62, on an ASUS M2N32-SLI Deluxe nForce 590 SLI board, with Corsair 4-4-4-12 800MHz RAM. Once again the Albatron 7900GT pulled rank on the graphics front.

AMD + ATI = A MAD IT!

Rumours have been flying since Computex that AMD was going to buy ATI, and the industry slowly convinced itself that it made sense. Then it happened, and everyone lost the plot. It was the cold water AMD needed to throw over the Conroe party, and as a result, here it is in its own little boxout.

ATI was bought for \$7.1bn in cash and shares, and AMD needed to take out a \$3.3bn loan to do it. Keep this in mind next time you need a new car. The deal is subject to ATI's shareholders agreeing (likely just a matter of process), but more importantly, has to be passed by the US Government. We dare say the Canadian Government will have a few things to say as well. The ATI name will disappear forever and both product sets will be marketed under the AMD name. Should things go pear shaped and the companies end up staying separate, ATI will pay AMD a cool \$213m for its trouble.

The acquisition allows AMD to fight Intel on a level playing field, with access to chipsets and integrated graphics across the PC and consumer electronics spaces. Not surprisingly, some ATI licences with Intel have not been renewed. ATI also stands to benefit from AMD's own manufacturing fabs, which should mean cheaper production costs – at this stage this is merely speculation, and it will be some time before this will happen, if indeed it ever does.

More exciting though is the potential architectural changes

that may hit the PC over the next two to five years as a result of the merger – with direct control over such powerful graphics resources, AMD will have the power to reshape the entire landscape – or divide it, if it doesn't watch its step.

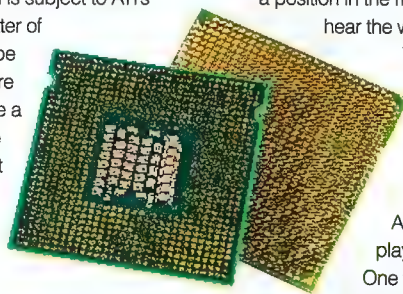
No-one really seems worried about Intel, it's assumed that 'big blue' can look after itself quite well already. Who else could pull off the comeback that is Conroe, and force AMD into such a position in the first place? Nonetheless we're sure we can hear the whips cracking in the research department.

The bigger concern is for NVIDIA, that arguably gave AMD a leg up into the industry thanks to its dominating nForce platforms. It probably isn't very happy right now. NVIDIA doesn't necessarily play well with Intel, but depending on how good AMD's diplomats are, it may be forced into playing a little nicer with its Santa Clara partner.

One thing is certain – there's now a whole new rule set being written that the graphics world will

need to adhere to. It's unlikely anyone will play hard and fast – we may see a few preliminary moves, but until the merged monolith plays its first hand, expect most people to tread lightly and carefully. Even then, don't expect big changes for a number of years.

In the short term, we expect ATI to help AMD flesh out its anorexic Live! offerings in the face of Intel's Viiv. Longer term, who knows where the GPU will head? We await the answers, and AMD's next attempt at the CPU performance crown.

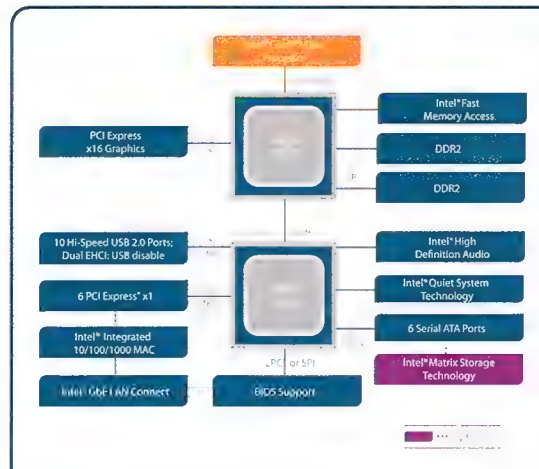


INTEL'S 965

There's a new chipset in Intel town, the 965, formerly known as Broadwater. It does have some improvements over the 975X, mostly stored in the ICH8 southbridge – such as support for DDR800 (975X still only officially supports 667), six 3Gb/s SATA ports and 10 USB ports – but there's also some annoying downsides too, like no CrossFire support (despite boards being available with two PCI-E slots), and no native IDE controller, requiring most manufacturers to shoehorn on a custom controller. At least this may finally force vendors other than Plextor to start making SATA optical drives.

The 965 chipset also gives rise to Fast Memory Access (FMA) via an update memory controller hub – essentially an improved out-of-order detection provided by a Just In Time command scheduler, which parolles the read queue looking for out-of-order and command overlap opportunities. When similar commands are found they are taken out of the order of the read queue and executed one after another. Fewer overhead commands are required, meaning clock cycles are used more efficiently. This is applied across the FSB and PCI-E bus.

Of course expect NVIDIA to get its nForce5 series out for



The P965 block diagram, with new MCH. Built for speed.

Intel very soon, and ATI's RD600 is rumoured to be the kick-arse 'be all and end all' solution for Conroe – so expect a tidy Core 2 board showdown in these pages soon.

THE TEST SUITE

We threw at both processors the multithreaded Cinebench 9.5 test, encoded a 1GB raw AVI into a 1300Kb/s XviD file, compressed the same 1GB file with WinRAR, encoded a 30-minute WAV file into MP3 using LameMT with the quality setting of 'alt-preset extreme', SuperPiMod was cranked up to four million digits, and finally we ran Half-Life 2 at 640x480 with all settings at their lowest in an attempt to cancel out the influence of the 7900GT.

Utter domination. Core 2 Duo simply romped it in against AMD's flagship, doing to AMD what AMD has been doing Intel for the past five years. Even better is the fact that the 965 outperforms the 975 at stock values, thanks to its new memory controller hub.

As if this wasn't enough, Intel has slashed the price of its pre-Conroe chips, and AMD has followed suit, possibly also in an effort to make Conroe seem less appealing. In fact prices just keep dropping, forcing us to wonder where the floor is. One thing is for sure: now is a fantastic time to buy a processor.

AMD is confident that its 4x4 platform will do well in the face of Conroe – however the cost of purchasing two CPUs will likely

turn most enthusiasts off, especially when games are unlikely to receive the benefits from so many cores. Mind you, Crysis is already on the dotted line as being multithreaded, so maybe we'll see results to the contrary.

Of course details around 4x4 are still nebulous, so AMD may still have a trick

up its sleeve (other than ATI) – either in performance or price. The current favourite rumour is custom drop-in chips, similar to what has already been announced for the upcoming Socket F platform – at this point, whatever it is, AMD needs to work hard and fast.

One thing is for certain – right now Intel is outperforming AMD's flagship chip significantly with a CPU that's clocked 200MHz slower, and priced \$700 cheaper, all the while grinning like a Cheshire cat.

Put away your AMD hat, pack up your Socket A board, file away your 939, put off your AM2 purchase. For that matter, wait a little longer for ATI and NVIDIA's boards for Intel, and see how they fare.

Core 2 Duo is here. Viva la revolution.

'Right now Intel is outperforming AMD's flagship chip with a CPU... that's \$700 cheaper.'

THE RESULTS

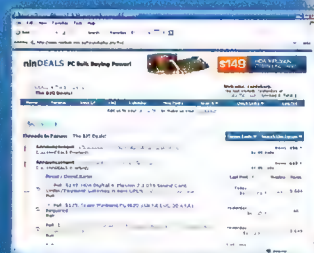
	AMD FX-62	Core 2 Duo X6800 (975)	Core 2 Duo E6700 (975)	Core 2 Duo E6700 (965)
Cinebench (score, higher is better)	780	885	812	827
LAME (minutes, lower is better)	1:27	0:53	0:58	0:57
VirtualDub (minutes, lower is better)	3:12	2:37	2:51	2:43
SuperPiMod (minutes, lower is better)	2m36.01s	1m45.828s	1m54.334s	1m48.203s
Half-Life 2 (frames per second)	186.44	247.61	228.52	236.83
WinRAR (seconds, lower is better)	12:55	12:19	12:34	11:54

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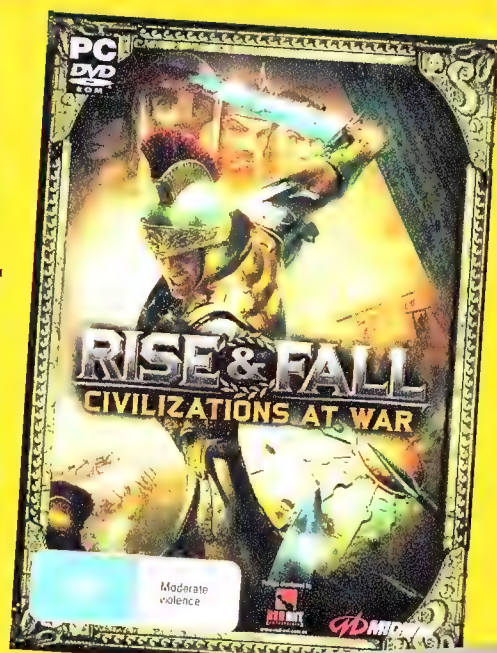
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RAVE REVIEWS

cont.

Aug. 26, 2005

"Absolutely exceptional memory capable of lower latency timings at stock speeds and still pull through with a jaw dropping overclock to boot."

tweaknews.com

Aug. 31, 2005

"In our tests, the PQI3200-1024DBUs turned out terrific performance along with impressive overclocking results....to top it off they're priced to sell!"

hothardware.com



THE ULTIMATE MEMORY FOR hardcore GAMERS

TECHNIQUE

HANDS-ON TUTORIALS, TIPS, AND TWEAKING
FOR THE TECHNICALLY INCLINED

Epic's Mark Rein gave a good stabbing to episodic PC gaming recently, claiming that the faster development turnaround would result in games with a lot of recycled content and that distribution is worthless without marketing – but most important was this statement: 'Full-price games have a cohesive start, middle and end.' I'm not sure if Mark realised the depth of the well he was plumbing with that statement – so allow me to expand and pull forth my view on episodic gaming.

It's stupid.

And particularly puzzling is the fact that Valve is spearheading it. Dare I say it, but it seems no more than a way to bolster up the content of Steam to sweeten it up for prospective clients.

It's like this – after years and years of bitching from developers that they shouldn't follow the broken Hollywood model (true enough), Valve has decided instead to evangelise the rule set of TV – making even less sense.

Valve has delivered to us, twice, the most engaging story-driven games of all time. Compartmentalised, those games would never have impacted on our psyche in the same way. TV works simply because it has a strong narrative (we hope) that is passively delivered – the wait between episodes actually enhances the experience.

Gaming requires interaction – interaction means less time for the story to be portrayed, especially if you're too busy employing typical gameplay elements like 'shoot bad guy, shoot another bad guy, oh look, surprise, another bad guy'. Games need to be longer in order to weave their narrative.

Not to mention the complete lack of fulfilment as you know that the game now has no ending. To a degree, the story can even be made up as they go along, often resulting in a weakly structured fiction with flaky direction.

Half-Life: Episode 1 pretty much confirmed my fears of this. Too short, little story and very little immersion – a casual gamer fest. This is the PC, not the consoles – we'd like some depth please. A friend of mine tried to cover for Valve: 'Episode 2 will be better' he said. 'That's what you said about Star Wars' I replied. The implicit connotations were enough.

Let's say I'm wrong though, and a developer manages to catch people's imagination in an episodic game – can you imagine if they had their funding cut off shortly after, the story unfinished forever? TV series at least are usually commissioned for a season if they pass pilot, and if they do get canned, there's a chance of them coming back if the public makes a noise (*Firefly*, *Family Guy*, *Star Trek*, *Futurama*).

If a game gets canned, we get ignored unless a developer at a solvent studio has a particular whim, but more likely only if their publisher sees gold in them there hills. And even then, *Sam & Max* is going groan... episodic.

Leave the episodes to Lost, gents, and please give us back our full-length games.

Craig gets infuriated by the Rubik's cube.

csimms@atomicmpc.com.au



this month

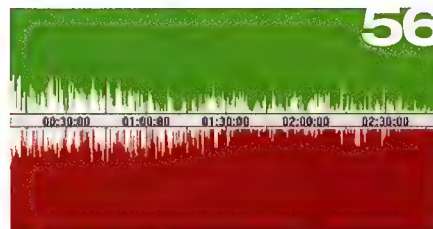
54



▲ Patch

No, it's not a sentimental old Robin Williams movie, it's our mental dumping ground.

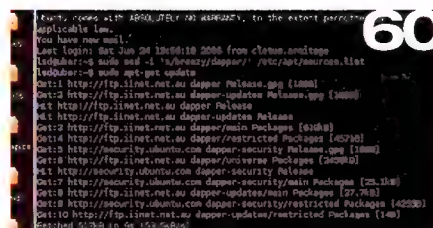
56



▲ Windows

So many people rip their CDs at 128Kb/s. They should be shot. Learn how to do it properly.

60



▲ Linux

Part four of the Uber Linux Box project. We call it Uncle Ubey, for short.

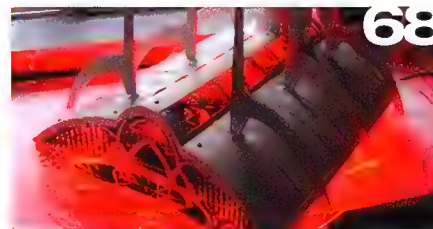
64



▲ Hardware

Ron Prouse is still rebuilding his beast. It's like the Opera House, but with better lighting.

68



▲ Hotbox

The final entries on the Hotbox of the Year calendar, before we start fresh!

DO YOU NEED HELP?

Stuck? Always wished you could achieve something but didn't know how? Wish you had a handy guide just sitting there to dig you out of a hole? Need new jeans? We can help on all but the last. If you have an idea for our monthly tutes, why not drop Craig a line on csimms@atomicmpc.com.au. Or alternatively you could just write to him, if you're not the line-dropping type.

tinytweaks

ClearType sucks!

Not a fan of ClearType and can't seem to get rid of it with the new beta of Internet Explorer 7? Seems like Microsoft wants you to disable it inside the browser instead of through the normal Display Settings option.

Getting rid of ClearType in IE7 is easy. Just click the Tools button, then Internet Options. Find the Advanced tab and uncheck 'Always use ClearType for HTML'. You'll need to restart the browser for this to take effect, so don't have anything super important open at the time. You could always use the new save session feature in IE7 Beta 3 to preserve your open tabs – when closing the browser down just click the 'Show Options' arrow widget in the close dialog and check 'Open these the next time I use Internet Explorer'.

Wiring diagrams

Wiring up a PC with a custom-made loom can be a lot of fun, but what happens when you have to make repairs or additions some time in the future? Suddenly things don't look so familiar, especially if everything is covered in cable braid! The answer is boring and time consuming, but absolutely invaluable if you ever need it – a hard-copy wiring diagram. Putting some effort in prior to starting is always a good idea, as it will save surprises during the build, but the important part is to document any variations and additions made as you go along. Another important factor to maintain is the integrity of the colour-coding of the wiring. After all, simplicity is the key to happiness.

Open sesame

Though Linux doesn't typically have problems with handling open files, they can cause issues when dealing with devices like sound cards and removable media. Many sound cards only allow one application to access them at once, and when you receive a 'can't open device' error it's not always obvious which application has it locked. The 'fuser' tool, can help here: 'fuser /dev/dsp' will display the process ID accessing the sound driver.

When unmounting a removable media device, any open file will cause problems. 'lsof' can help here, listing every open file on the system along with the user and application responsible. By piping its output in to 'grep' you can quickly find the culprit.

MODLIGHT

Underworld: The Legend of Nephthys

Warcraft 3 mod

www.cryptikarma.com

Enough with the first person shooter mods! We had a look online to find something a bit different for you, and came up with a total conversion mod for Warcraft 3 called Underworld: The Legend of Nephthys.

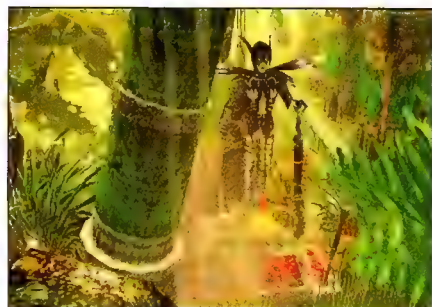
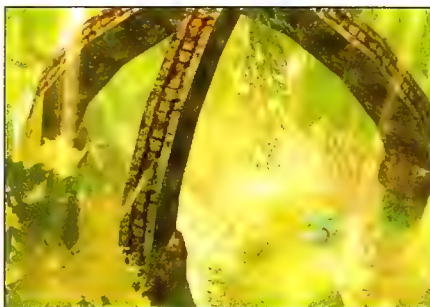
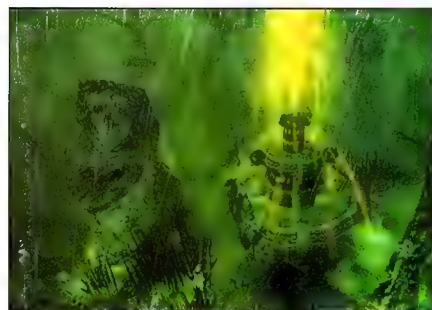
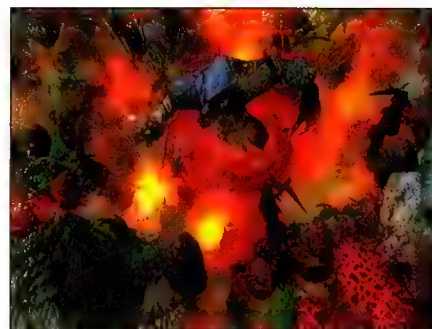
Nephthys is basically one of many powerful god-like beings called 'titans', according to the game's canon. After unleashing evil and corruption on the universe, the other titans banished her to an eternity as a lifeless stone statue. Now, after many thousands of years, she has materialised on the world of Azhur looking to unleash some major arse-kicking.

The map/mod continues this story, with the player controlling a hero on Azhur who becomes involved with defeating Nephthys.

Underworld, according to the mod's website (www.cryptikarma.com), is more than just a fan-made map. For one, the developers have redone many of Warcraft 3's textures to improve their resolution. They've also added new special effects, custom sound effects and music, extra AI scripts for all mobs and NPCs and extremely detailed maps. It is in effect a complete campaign, with a leaning toward role-playing instead of strategy. As you progress through the game, you'll be gifted with new abilities and levels to help you defeat the evils you'll face. Underworld will also boast a non-linear structure, and choices you make throughout the campaign will influence the direction of the story and change the options available to you later on.

With Warcraft 3 having been dominated for the past few years by the multiplayer mod Defence of the Ancients (DotA), Underworld is a breath of fresh air. The single-player focus of Underworld is one of the mod's big draw cards and helps it to stand apart from the likes of DotA.

If you've been hanging to play Warcraft 3 again, but aren't exactly a fan of competition ladders or multiplayer in general, then you should definitely check out Underworld. The developers plan to release the mod in parts, with the first slated for August.



patch of the month updates that matter**Titan Quest 1.11**

Having problems with Iron Lore's Titan Quest? Then this patch is for you. Updating the game from V1.01 or 1.08 to 1.11, the patch fixes a crash due to loading custom maps; corruption caused by low memory video cards and a number of crashes and errors with ATI MOBILITY RADEON chips. New to this version is 'Time Smoothing' that reduces blurring while the player is moving and triple buffering so vsync can be enabled without a performance hit.

**antisearch** things you should never type into Google Image Search

You'll need to switch Google's SafeSearch feature to 'moderate' to get the treasures from this one. Let's just say that 'saving the whales' has never been so unappealing.



'bowl of soup'

quote of the month learn from the masters

'There are many methods for predicting the future. For example, you can read horoscopes, tea leaves, tarot cards, or crystal balls. Collectively, these methods are known as "nutty methods". Or you can put well-researched facts into sophisticated computer models, more commonly referred to as "a complete waste of time".

- Scott Adams

distrowatch where it's at in the world of Tux

Distribution	Stable	Beta	Website
Ubuntu	6.06	None	www.ubuntu.org
Debian	3.1r2	sid	www.debian.org
SuSE	10.1	10.2alpha2	www.opensuse.org
Fedora Core	5.0	6.0test1	fedora.redhat.com
Mandriva	2006	2007alpha	www.new.mandriva.com
Gentoo	2006.0	2006.1	www.gentoo.org
Knoppix	5.0.1	None	www.knoppix.com

powertools**RivaTuner**

www.guru3d.com/rivatuner

Remember when the GeForce didn't exist? When the TNT was actually prefixed with 'RIVA'? This app is that old, yet is still updated. Overclock, monitor and tweak your video card, whether NVIDIA or ATI.

**Saw it!**

www.bunnings.com.au/site

If you are looking for an affordable scroll saw – the perfect cutting tool for performing detail work in wood or plastic (not metal) – then check out the GMC range at your closest Bunnings Hardware – \$49 at the time of print!

**PSP Video Converter**

pspvc.sourceforge.net

This handy GUI front end for FFMPEG has just one job in life – converting videos to MPEG4 format for playback on your PSP. There are dozens of tools that can do this, but none are this easy.

**SITES OF THE MONTH**

www.processlibrary.com

Wondering what the heck WDV2SA.exe is in your process list? Is it a Trojan, or just a temporary process for a program install? Whack that name into Process Library and it'll tell you what it's for.



www.phoronix.com

Hardware and software review sites are a dime a dozen, but Phoronix focuses fairly and squarely on Linux. If you want to know the latest hardware runs with the penguin, this is the place.



www.mofocases.com

The good, the bad and the outright ugly, including a few from the Atomic community forums. A small site, but some of the more interesting mods have been assembled here. Be sure to check out 'Heavy Metal' and some of the other high quality 'cases'. The 'Worst Cases' area is worth a laugh!



WINDOWSTUTORIAL

Make Windows do really useful things!



Sound advice

Craig Simms shouts 'You little ripper!'

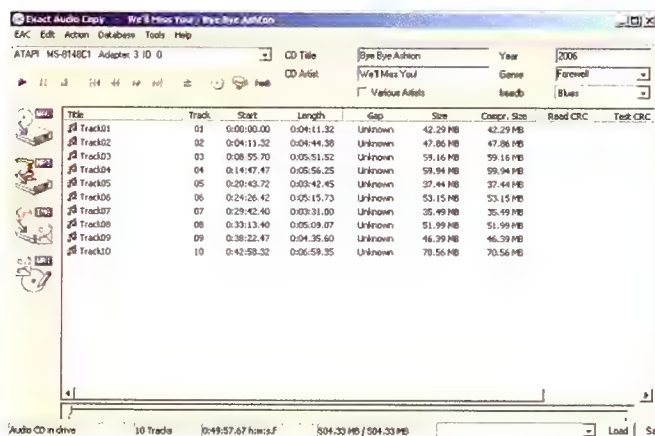
Legalities

The Australian government will hopefully soon be passing copyright reform legislation making 'format shifting' legal – meaning that you'll be able to rip from audio CDs to MP3 quite legally for the first time in this country. There are of course some stupid restrictions regarding other changes to the copyright laws, like only being able to watch a recorded TV show once afterwards and then requiring you to delete it, but this restriction seems to be avoided in the audio field so long as the format never stays the same. The jury it seems is still out on copy protected audio CDs.

So for now, we trust that you'll only use this tutorial for copyright free audio CDs – and then rip with impunity once the new laws pass.

Let's not beat around the bush – if you're the type of person who can listen to 128Kb/s MP3s and not cringe, you may as well grab the first all-in-one MP3 ripper you can find, complete with Xing MP3 codec, and you deserve everything you get. If on the other hand you like to preserve the quality of your music, read on.

The first tool in any ripper's toolkit is Exact Audio Copy. With so many error correction features, and even a 'Paranoid' mode, you can rarely go wrong.



▲ EAC makes ripping fun. As does a whoopee cushion.

Exact Audio Copy

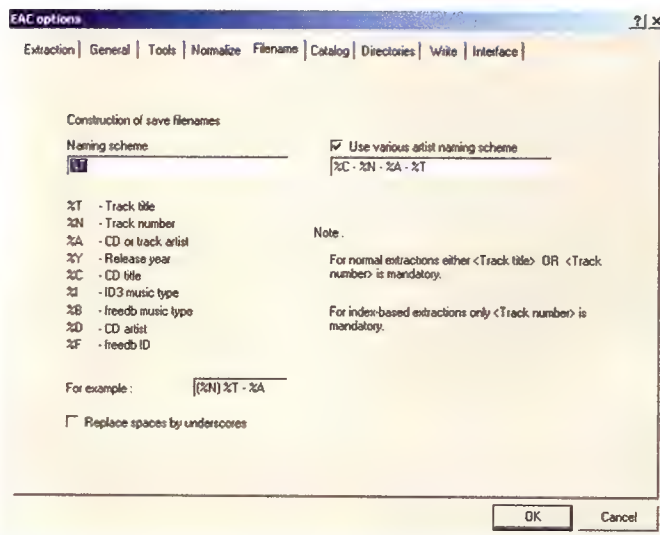
Grab a copy from www.exactaudiocopy.de and extract or install, depending on the version you've downloaded. During the setup, ensure you click 'I prefer to have accurate results'. You'll then be prompted to install and configure LAME through the program interface – don't. We'll want to do this manually later. Next, enter your email as something nonsensical, which will allow you to access freedb's CD database so you can automatically assign album and track names to any CD you may enter. Finally, tell EAC you're an expert and we'll get into the options.

Click on the EAC menu and choose EAC Options. On the first tab (Extraction), change 'Error Recovery Quality' to 'High'. Go to the general tab and check 'On unknown CDs' and set it to 'Automatically access freedb database'.

On the Tools tab, you may wish to create a playlist automatically when ripping has finished, so selecting 'Create .m3u playlist on extraction' will fulfil that desire. You may also wish to automatically log the status report, for inclusion with your rips so you can refer back to their quality at any time.

It's really not a good idea to run a compressor in the background (or really do anything while ripping), but those with dual core processors may be able to get away with it.

Normalise attempts to set all track volumes to the same level – leave this off for now. Set the naming scheme you're most comfortable with through the Filename tab. Artist and track name are a minimum, but you may wish to include the CD title and track numbers as well if you're ripping full albums. If you want a different naming scheme for compilation albums, select the 'Use various artist naming scheme' option – you may for example, wish to include the CD title (%C).



▲ The arcane art of filename conventions.

Various Artists

Most assume this option doesn't have much flexibility, as it seems to miss the individual artist names whenever they throw in their compilation CDs – but they assume wrong! Just make sure your track title in EAC is in the format of **Artist / Track Name**, and everything should be hunky dory. If freedb has imported the track names and artists happily, but has them the wrong way around, you can easily fix this by going to Database > Transform Actual CD Information and choosing 'Exchange Artist <-> Title'. See? Not so useless after all.

Drive Options

Go to EAC > Drive Options, and make sure you're in secure mode. This is considerably slower than the other modes, but will get you more accurate results, and is better if errors start cropping up on your disc.

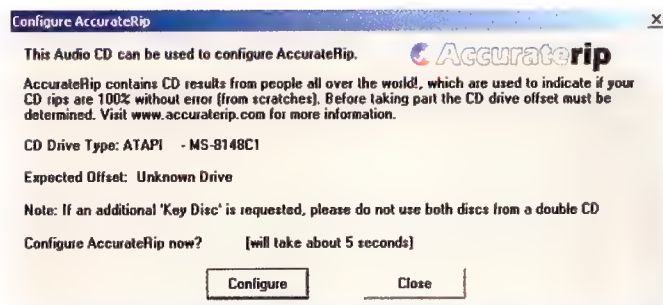
If you get odd results when you rip, you may have to fiddle with a few settings on the 'Drive' tab to get things to suit your drive. You'll notice an Offset tab – we'll deal with this now, but in a more round about manner. Close the dialog and EAC. Note that you'll have to configure every drive individually that you wish to use in EAC.

Good calibrations

Not all optical drives are built the same, as our good friend Zebra would attest to. They won't all start and finish at the same place on an audio CD, meaning that sound could be lost at either end. It's usually insignificant, but the purist likes to get these things right. The easiest way to find the offset is to simply download Accuraterip (www accuraterip.com) and dump the installed DLL file into your EAC directory. Put a music CD in the drive you wish to configure with Accuraterip and start EAC. Accuraterip will then check its database, and if you're lucky, your drive will be in it and the values can be set automatically. Mind you, in reality for every single disc you rip that's mastered by a different mastering unit, the offset will be different as the mastering units themselves will use a different offset, meaning that the value is really entirely relative. For the sake of easiness, one offset value is accepted for all rips – if you need to be more precise or your drive isn't in the database, check out pageperso.aol.fr/Lyonpio2001/offset.htm for obtaining a manual value. You may need to close EAC and rename the Accuraterip.dll file to regain access to the offset input boxes.

Offsets should only affect the first and last tracks, and although there is a write offset function, this shouldn't be required if a properly offset read is performed.

Accuraterip also provides peace of mind, as after the ripping is finished, it then compares it to other rips people have made of the same track and gives you a 'confidence rating' – basically whether or not people got the same results. This is another way of ensuring a decent rip. Make sure to upload your results afterwards – the bigger the database, the better the community becomes.



▲ Accuraterip helps to set your read offset automatically.

Before you rip

Clean the CD! Sounds crazy, but it will help to prevent possible read errors. Some of that spray stuff with a soft cloth that you can buy from Big W or other associated stores does wonders. Some even recommend compressed air to blow off the smaller particles.

You can now finally rip your CD to WAV if you like after all that setup – just don't do anything that taxes the CPU at the same time! Simply select the tracks you wish to rip and hit the big WAV button. This is good for checking to see if your drive is accurately ripping, but of course in the long run you'll want to compress to another format, and since we can automate that process through EAC, don't waste your time ripping the whole album just yet!

Sounds of silence

Sometimes when you rip from CD you'll get nothing but big fat silent MP3s – still the right length, but there's absolutely nothing as far as sound is

concerned. This is EAC's way of saying it can't communicate with your drive properly. There are two ways to fix this, and both of them involve installing an ASPI layer. You can either grab ForceASPI from www afterdawn.com/software/cdr_software/cdr_tools/forceaspi.cfm (ignore the recommendation to get the newer ASPI, it has brought nothing but troubles since its release long ago), or grab Ahead's ASPI DLL from its site and dump it in the EAC directory. Ahead doesn't like you doing this for 'other software burning programs', but that's okay, because we won't be using EAC's burning function anyway, right? Grab it from here: www.nero.com/nero6/eng/WNASPI32.DLL.html.

Go to EAC Options, click the Interface tab and 'Installed external ASPI interface' should no longer be greyed out. Select it, click OK and restart EAC. Your problems should be gone.

Conversion, software, version 7.0

Which format you should compress to causes more debate than whether or not Paris Hilton can sing. Some argue that it's about pitch and perfect audio reproduction, others say it doesn't matter so long as you get the general idea, and they don't quite mind the visualisations either.

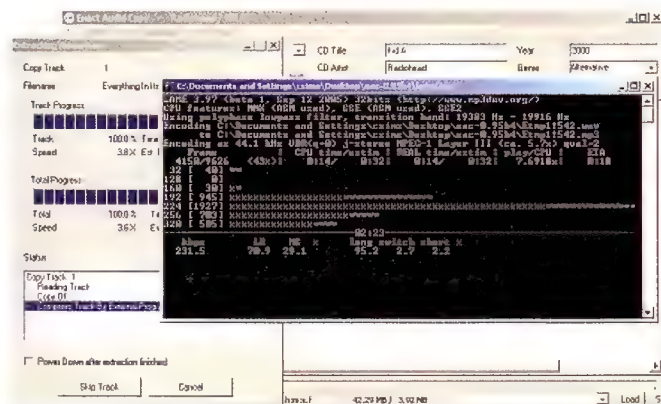
Pure audiophiles use completely lossless formats. We're not going to get into a format war, but we are going to give you a run down of how to convert to some of these formats. Just make sure you're converting from the cleanest possible source – if you've used lossy compression like MP3, and convert from that to another lossy compression like OGG, it's just going to get worse, much like saving a JPEG over and over again. Start with the WAV file you initially ripped from EAC. If you want to be the most pedantic listener on the planet, head over to ubernet.org and read to your heart's content. You may also want to head to hydrogenaudio.org and join the ranks of opinionated audiophiles hiding there. Opinionated audiophile? We love a good tautology at Atomic.

MP3

MP3 is a worldwide accepted audio format, and you can't go past LAME for MP3 encoding. Quality and options vary between versions, and evidence on the Net suggests that 3.90.3 was the last 'golden' child and is widely used. You can get the executable from www.ubernet.org/?p=UberGuide. Drop it into your EAC directory.

Now while we're big fans of brute forced constant bitrate 224Kb/s MP3s, it is wasteful on space – so we'll use the Ubrnet standard for encoding our MP3s – not to mention this standard pulls off a few tricks for brilliant sounding audio. If you want to follow the standard to the letter, then you have a bit of reading to do on naming conventions, and you'll probably want to download Ubrnet's supplied config files as well for auto-configuring EAC, not to mention Ubrnet's quality checking tool.

Otherwise, open up EAC and go to EAC > Compression options and go to the External Compression tab. Check 'Use external program for compression' and select 'LAME MP3 Encoder' from the drop down list. Hit the browse button and find your LAME.exe file that you previously



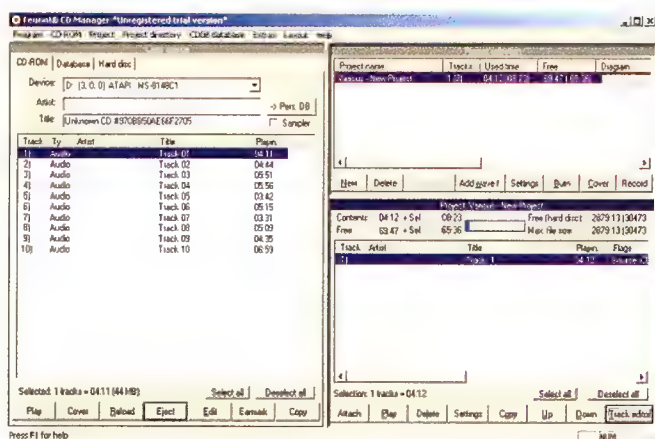
▲ After ripping with EAC, LAME is called and encodes using the --alt-preset extreme setting.

dumped into your EAC directory. Now, just click the Open button.

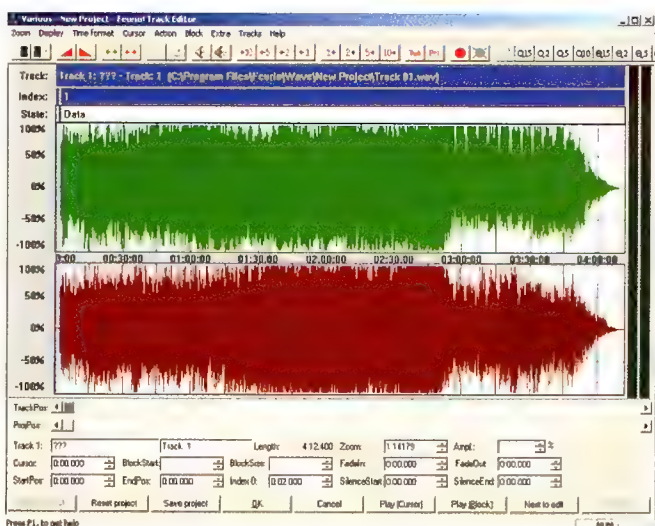
In the 'Additional command line options' input field, enter **--alt-preset standard**, which should create a VBR MP3 averaging around 200Kb/s. Audio quality is of course subjective based on the listener's hearing capability, so you can use **--alt-preset extreme** to average around 260Kb/s if you're still sure you can hear differences. For any higher bitrate, it's recommended to use a lossless format like FLAC rather than going the full 320Kb/s MP3 hog. The bitrate drop down box will be ignored in the face of this command line. Click OK, select the tracks you wish to extract, then hit the MP3 button to start the extraction. You may wish to only do one track first to check quality.

OGG

OGG is a big hit in the open source world, and is even being used in games these days as the Miles Audio Engine supports the format. To encode to OGG, we want to grab one of the recommended tools from Hydrogen Audio's wiki - wiki.hydrogenaudio.org/index.php?title=Recommended_Ogg_Vorbis. In this case we'll be grabbing one of John33's builds, as they are command line based. Drop the extracted executable into your EAC directory, point EAC towards it like you did with the MP3 encoder, and set the Parameter passing scheme drop down box to 'Ogg Vorbis'. In the 'Additional command line options' field, type **-q 8**. This sets the quality setting to 8 out of a possible 10 – you may wish to play with this based on your ears, of course. This should be approximately the same size as the extreme Ubertnet MP3 standard. A value of 7 approximates the Ubertnet standard.



▲ Feurio will help with gapless CD authoring.



▲ Feurio's track editor works better than Nero's, but is a lot more unwieldy.

FLAC

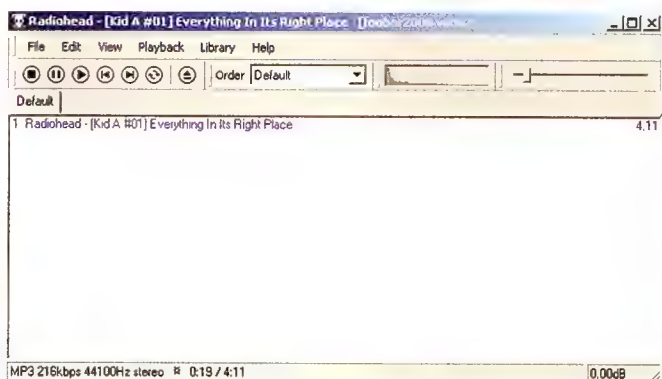
To encode to FLAC, grab the 'Tools only' package from its website at flac.sourceforge.net/download.html. Copy flac.exe from the extracted bin sub directory, and dump it in your EAC folder. Go to EAC > Compression options, set the Parameter passing scheme drop down box to 'User Defined Encoder' and the file extension to .flac. Browse to flac.exe and use the additional command line options: **-T "artist=%a" -T "title=%t" -T "album=%g" -T "date=%y" -T "tracknumber=%n" -T "genre=%m" %s** (thanks to Case's configuration page for this: www.saunalahti.fi/cse/EAC/index.html). There are no quality settings in FLAC as it's lossless, but you can set the compression algorithm if you like by adding a **-#**, replacing the # with a number between 1 and 8, 1 being the fastest and 8 being the highest compression.

If you want to encode to multiple formats at once, try MAREO. It's available at www.webearce.com.ar for some simultaneous encoding joy, and comes with instructions to set it up within EAC.

Gapless recording

Can't get the gaps inbetween tracks to disappear when burning an audio CD? This is especially a pain with live CDs, which have the audience continually going in the background. Step one is – don't use Nero! Nero has a dubious history when it comes to this. Instead try Feurio from www.feurio.com. Make sure in your that the 'Pause between tracks' setting is set to 'Do not insert pauses between tracks' in your project parameters – and you're away!

Secondly, don't use MP3 sources – silences can be inserted during the conversion process, so start with an original WAV source if you can. If you have to use MP3s for joined tracks, open your favourite WAV editor and combine all the tracks into one big bastard, editing manually where required. Then open up the track editor in Feurio and manually insert track points – you'll have to zoom in quite a bit, then set the cursor to its position by clicking the up and down buttons next to the cursor field, rather than entering a value, as this won't move the cursor. Then click the fifth icon from the left to create a 'linked' track separator. Click 'Save project', 'OK' and then burn to your heart's content. Fingers crossed, everything should work.



▲ What you use for playback is just as important as recording. Foobar is a simple, yet flexible and powerful media player. The more you use it, the better it gets.

Closing up

Hopefully this has given you a little insight into properly ripping audio, rather than dealing with the sub-par 128Kb/s crap that sits on hard drives around the world. We don't claim to be the absolute authority on audio quality – that much is for the loons at Ubertnet and Hydrogen Audio, and others that buy \$5000 gold braided cables to claim audiophile status.

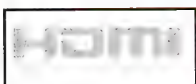
You may even wish to start using a tool like The GodFather or MP3Tag to organise and retag your existing collection, separating the good quality from the spurious, or purchase the godly amount of storage required to start ripping in a lossless format such as FLAC or SHN. Just make sure to keep it all nice and legal!

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Web: www.kingmax.com.au
Sydney Office: 02 9648 4658
Melbourne Office: 03 9551 8298
E-mail: sales@kingmax.com.au

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The Uber Linux Box Challenge Part 4

Leigh Dyer ups the uber ante as his little box of Linux starts to take shape.

If you've been keeping up with the Linux news lately, you've probably already heard that Ubuntu 6.06 LTS, codenamed Dapper Drake, has finally been released. The 'LTS' part stands for Long Term Support, because Ubuntu plans to support the release with security updates and fixes for at least the next three years. This release is designed from the ground up to be as solid as a very solid thing, so it'd be perfect for our Uber Box.

It's a good thing for us that Ubuntu uses APT for package upgrades. Forget individual packages though – you can upgrade your entire OS with APT, and it's far easier than it has any right to be.

Dapper ho!

- 1 Edit your APT sources and change your distribution from 'breezy' to 'dapper'. If you're still running the GUI you can do this through the update manager, or you can edit the file manually:

```
sudo nano /etc/apt/sources.list
```

Each uncommented line represents a software repository, listing the base URL, distribution version, and one or more sub-repository names. Change all the lines that have 'breezy' as the distribution version to read 'dapper' instead, then save the file.

If you're brave, you can skip the editor and use the 'sed' tool to do a find and replace:

```
sudo sed -i 's/breezy/dapper/' /etc/apt/sources.list
```

- 2 Refresh your package lists by running 'sudo apt-get update'.

- 3 To perform the upgrade, run 'sudo apt-get -u dist-upgrade'. The '-u' flag causes apt-get to list all the packages to be upgraded; it should be a pretty hefty list. apt-get also displays a summary of the total size of the packages to be downloaded, and the extra disk space required. Type 'y' to proceed with the upgrade.

```
ls@ubuntu:~$ sudo apt-get update
Get:235 http://ftp.iinet.net.au dapper/main dosfstools 2.11-2.1ubuntu1 [52.0kB]
Get:236 http://ftp.iinet.net.au dapper/main e2fslibs 1.38-2ubuntu2 [78.4kB]
Get:237 http://ftp.iinet.net.au dapper/main e2fsprogs 1.38-2ubuntu2 [270kB]
Get:238 http://ftp.iinet.net.au dapper/main libdevmapper1.02 2:1.02.05-1ubuntu1 [35.2kB]
Get:239 http://ftp.iinet.net.au dapper/main sinitc 2.0.13-4ubuntu1 [77.4kB]
Get:240 http://ftp.iinet.net.au dapper/main findutils 4.2.27-1ubuntu1 [290kB]
Get:241 http://ftp.iinet.net.au dapper/main gettext-base 0.14.5-2ubuntu3 [51.4kB]
Get:242 http://ftp.iinet.net.au dapper/main libbz2 1.06-3 [56.8kB]
Get:243 http://ftp.iinet.net.au dapper/main libpencod8 0.8.7-2 [62.3kB]
Get:244 http://ftp.iinet.net.au dapper/main libtasn1-2 0.2.17-1ubuntu1 [40.5kB]
Get:245 http://ftp.iinet.net.au dapper/main libgnutls12 1.2.9-2ubuntu1 [372kB]
Get:246 http://ftp.iinet.net.au dapper/main libssl2 2.1.19.dfsg1-0.1ubuntu2 [256kB]
Get:247 http://ftp.iinet.net.au dapper/main libssl-modules 2.1.19.dfsg1-0.1ubuntu2 [140kB]
Get:248 http://ftp.iinet.net.au dapper/main libldap2 2.1.30-1ubuntu3 [144kB]
Get:249 http://ftp.iinet.net.au dapper/main libusb-0.1-4 2:0.1.10a-22ubuntu1 [17.6kB]
Get:250 http://ftp.iinet.net.au dapper/main makedev 2.3.1-7ubuntu1 [41.5kB]
Get:251 http://ftp.iinet.net.au dapper/main gnupg 1.4.2.2-1ubuntu2 [981kB]
Get:252 http://ftp.iinet.net.au dapper/main grep 2.5.1.ds2-4 [98.7kB]
Get:253 http://ftp.iinet.net.au dapper/main grepdp 1.1.0-1 [19.5kB]
Get:254 http://ftp.iinet.net.au dapper/main grip 1.3.5-12 [70.8kB]
Get:255 http://ftp.iinet.net.au dapper/main hostname 2.91.0ubuntu1 [992B]
Get:256 http://ftp.iinet.net.au dapper/main net-tools 1.60-1ubuntu2 [168kB]
Get:257 http://ftp.iinet.net.au dapper/main ifupdown 0.6.7ubuntu7 [40.6kB]
Get:258 http://ftp.iinet.net.au dapper/main klibc-utils 1.1.16-1ubuntu3 [97.3kB]
22% [259 klibc-utils 2575/97.3kB 2%] [102 linux-image-2.6.15-25-386 12206880/21.6MB 56%]
```

▲ OMGZ ADSL2 FTW!

Downloading and upgrading all those packages will take some time, but the machine as a whole will stay up and running throughout the process. Services like Squid and Samba will be shut down before being upgraded, but they should fire right back up once the new version is in place.

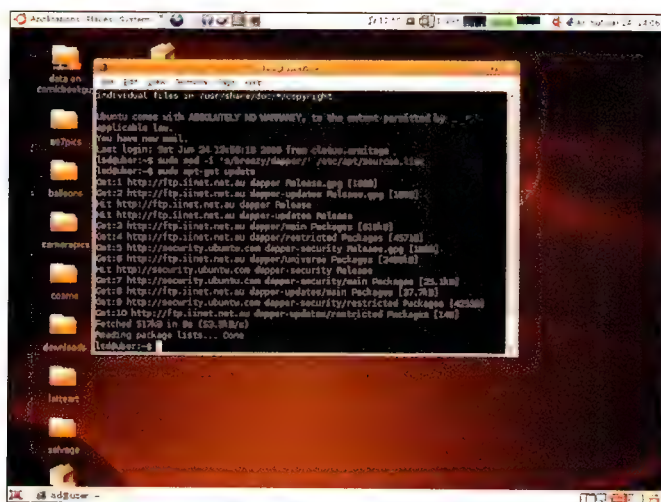
A reboot after the upgrade completes is a good idea, since the new Linux kernel installed won't be loaded until the next boot. There's no hurry though, so you can plan your reboot at a convenient time.

This is a RAID!

I'm sure RAID isn't a new concept for *Atomic* readers, but if you've only dabbled with crappy on-board RAID controllers you're really missing out. Linux has an advanced software RAID system that can do just about everything a \$1000+ dedicated RAID controller can do, but with even greater flexibility.

To keep files safe on our Uber Box, we're looking at RAID 5, which works with three or more identically-sized drives (or partitions). Unlike the RAID 0 striping often used to speed things up on a desktop box, RAID 5 can tolerate the death of a hard drive without losing data. The trade-off is that you lose one drive's worth of storage to parity information.

We're using three drives: a couple of old 30GB drives and a 30GB partition on a larger drive, giving us 60GB of RAID-protected storage. Follow these steps to set up your RAID array:



▲ Before our upgrade we need to refresh our package lists.

Linux fundamentals: The boot process

You don't really need to understand the magic that happens during the Linux boot process. That is until you start installing multiple operating systems or making major hardware changes.

It all starts with the BIOS, which loads the boot sector from the primary hard drive. On a Linux system, the boot sector loads a boot loader – usually the Grand Unified Bootloader, or GRUB – that loads the Linux kernel, which begins to initialise the system. Most importantly, it loads the hardware and filesystem drivers necessary to mount the root partition. Once it's mounted, the kernel hands control to an application called 'init', which runs through the system's startup scripts.

The boot process presents chicken-and-egg problems, particularly for accessing the root directory. Driver modules for the kernel are stored on disk, but without them, the kernel can't access the disk. Most Linux systems bundle the required

drivers in to an initial RAM disk, or 'initrd', which is loaded into RAM along with the kernel by the boot loader. The Ubuntu kernel packages build these images at installation after scanning the system to determine which modules are required.

Also, the boot loader needs to load the Linux kernel and initrd image, as well as handle all the various storage methods that Linux can use. GRUB can read most common Linux filesystems, but doesn't support LVM, or software RAID levels other than 1. This is why the Uber Box has a small /boot partition – if the kernel image was on a logical volume, GRUB would be unable to load it.

The 'init' process that begins once the root partition is mounted completes the system setup. This includes detecting and loading modules for hardware, mounting other volumes, enabling swap space, configuring networking, and starting

system services. Services have their own startup scripts in the /etc/init.d/ folder, but you haven't learned how these are run at boot.

Rather than start everything stored in /etc/init.d, the startup scripts look in the /etc/rc2.d folder, which contains symbolic links to the /etc/init.d scripts. These 'symlinks', are like a shortcut file in Windows, but operate at the filesystem level: any application can access the symlink just as if it was the original file. If a service in /etc/init.d has no matching symlink in /etc/rc2.d, it's not started at boot. The symlink names all start with 'S', followed by a number, and then the name of the startup script. The number determines the start order at boot: lower numbers are started first.

The final 'init' step starts login shells on the text console, letting you log in locally to systems that don't run a GUI. The GUI system is actually started through /etc/init.d by the 'gdm' service.

- 1 Physically install any new hard drives, and check the output of 'dmesg' for mention of them on boot. IDE drive names start with 'hd', while SATA and SCSI drives start with 'sd'. To check for IDE drives, for instance, try this:

```
dmesg | grep hd
```

Our system shows two new 30GB IDE drives, at /dev/hdc and /dev/hdd.

```
lsd@uber:~$ sudo badblocks -sv /dev/hdc
Password:
Checking blocks 0 to 29888820
Checking for bad blocks (read-only test): 605680/ 29888820
lsd@uber:~$ sudo hdparm /dev/hdc

/dev/hdc:
multcount    = 0 (off)
IO_support   = 1 (32-bit)
unmaskirq    = 1 (on)
using_dma    = 1 (on)
keepsettings = 0 (off)
readonly     = 0 (off)
readahead    = 256 (on)
geometry     = 50903/16/63, sectors = 50777640, start = 0
lsd@uber:~$ sudo hdparm -Tt /dev/hdc

/dev/hdc:
Timing cached reads:  588 MB in  2.01 seconds = 292.23 MB/sec
Timing buffered disk reads:  82 MB in  3.01 seconds = 27.26 MB/sec
lsd@uber:~$ sudo badblocks -sv /dev/hdd
Checking blocks 0 to 29888820
Checking for bad blocks (read-only test): 406348/ 29888820
```

- ▲ Even with RAID, block scanning an old hard drive before use is a good idea.

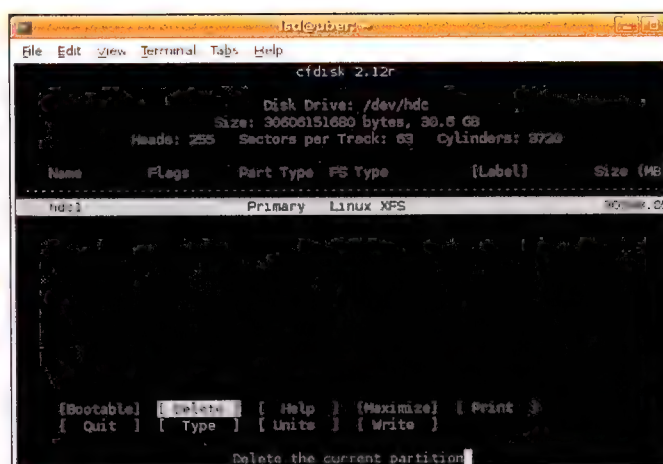
- 2 Prepare the new drives. When reusing old drives a block-level scan is probably a good precaution. This can be done with 'badblocks':

```
sudo badblocks /sv /dev/hdc
```

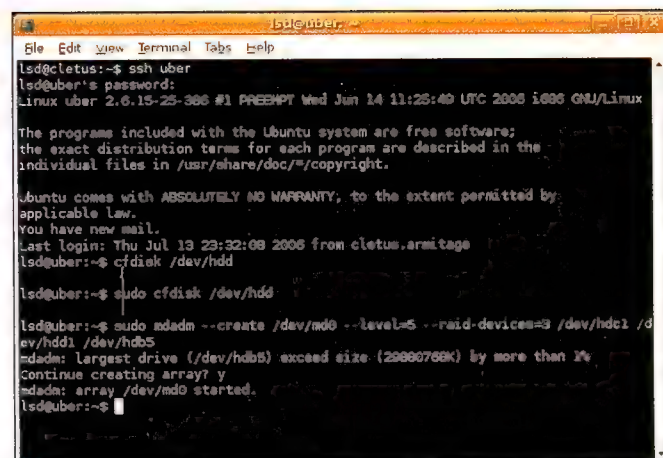
Assuming that passes, you need to set up the drive's partition table. We're using all of both drives, so we just want a single big partition on each. Use 'cfdisk' to edit the partition table:

```
sudo cfdisk /dev/hdc
```

cfdisk is as easy to use as a lobotomised politician with puppet strings and a middle initial of 'W'. Use the 'Delete' option to remove any existing drives, then create a new one, accepting all the defaults. Select 'Write' to save the changes before exiting. See? Easy.



- ▲ cfdisk makes drive partitioning (relatively) easy.



- ▲ Fire up that RAID array!

- 3 Use the 'mdadm' command to create the array:

```
sudo mdadm --create /dev/md0 --level=5 --raid-devices=3 /dev/hdc1 /dev/hdd1 /dev/hdb5
```

The new array will be available at '/dev/md0'. Run 'cat /proc/mdstat' to check its status and you'll see the OS performing an initial 'rebuild', syncing parity information across the drives. Though it won't tolerate a


```

lsd@uber:~$ sudo cfdisk /dev/hdd
lsd@uber:~$ sudo mdadm --create /dev/md0 --level=5 --raid-devices=3 /dev/hdc1 /dev/hdd1 /dev/hdb5
mdadm: largest drive (/dev/hdb5) exceeds size (29880768K) by more than 1%
Continue creating array? y
mdadm: array /dev/md0 started.
lsd@uber:~$ cat /proc/mdstat
Personalities : [raid5]
md0 : active raid5 hdb5[3] hdd1[1] hdc1[0]
      59761536 blocks level 5, 64k chunk, algorithm 2 [5/2] [UU_]
      [>.....] recovery = 3.1% (939848/29880768) finish=39.4min
      speed=12221K/sec

unused devices: <none>
lsd@uber:~$ cat /proc/mdstat
Personalities : [raid5]
md0 : active raid5 hdb5[3] hdd1[1] hdc1[0]
      59761536 blocks level 5, 64k chunk, algorithm 2 [3/2] [UU_]
      [>.....] recovery = 3.2% (968576/29880768) finish=38.9min
      speed=12364K/sec

unused devices: <none>
lsd@uber:~$

```

▲ The array needs to rebuild after creation, but you can start using it in the meantime.

drive failure until the rebuild is complete, you can format and mount it straight away:

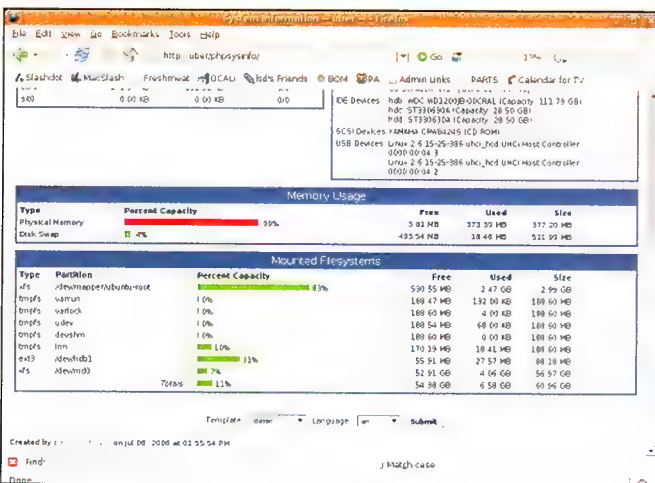
```

sudo mkfs.xfs /dev/md0
sudo mkdir /raid
sudo mount /dev/md0 /raid

```

To keep the array running permanently you'll need to add an entry to the '/etc/fstab' table to remount it on each boot. Just copy the line for your '/home' partition, changing the device to '/dev/md0' and the mountpoint to '/raid':

```
/dev/md0 /raid xfs defaults 0 2
```



▲ Move your /home partition onto the array to keep all your personal files safe.

Another option would be to use the array to store the contents of /home. With the array mounted on /raid, copy the contents of /home over:

```

cd /home
sudo cp -a * /raid

```

Then, edit your '/etc/fstab' to mount '/dev/md0' at '/home', and reboot. Once you've confirmed that the changeover was a success, and that your files are all intact, you can use the 'lvremove' command to delete your old '/home' logical volume.

Performance on RAID 5 can be a bit of a mixed bag: having your data striped across multiple drives can improve read performance, but having

to write to multiple drives can lower write performance. This is the nature of RAID though: it's always a trade-off between safety, performance, and cost. Our array of recycled drives still managed to write about 20MB/s, which is certainly usable enough.

If a drive in your array dies, you'll need to replace it as soon as possible. Once the new drive is in place, use the 'mdadm --manage' command to add it to the array. This will kick off a rebuild, but as with the initial build you can keep using the array while it's running.

```
sudo mdadm --manage /dev/md0 -a /dev/hdd1
```

My Spidey sense is tingling!

If you check freshmeat.net, a popular open-source application database, you'll find literally hundreds of Web applications available for download: website-building systems like Drupal and PHP-Nuke, forums like phpBB2, groupware suites like phpGroupWare... and the list goes on. Probably a good 90 percent of these tools run on a platform collectively known as LAMP: Linux, Apache, MySQL, and PHP. We have Linux covered of course, and last month we installed Apache and PHP so quickly that you'd have missed it if you blinked.

To complete the set we need MySQL, a fast and relatively lightweight database server. Thankfully, this is just as easy to install as Apache and PHP were:

```
sudo apt-get install mysql
```

You'll also need to install and load PHP's MySQL module:

```

sudo apt-get install php5-mysql
sudo /etc/init.d/apache2 restart

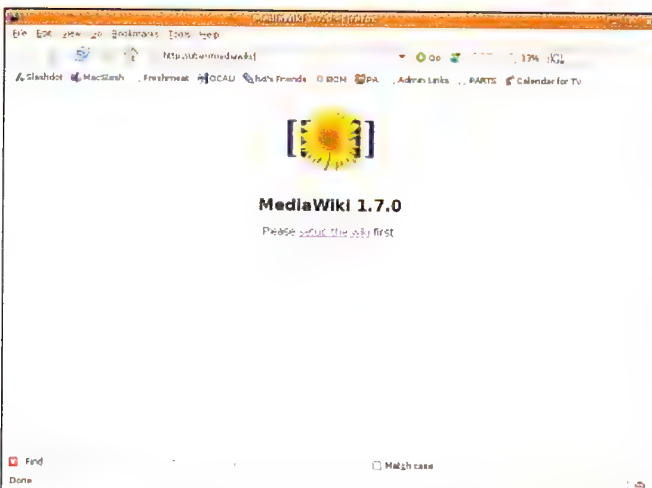
```

Setting a password on MySQL's 'root' admin account is a good idea too:

```
mysqladmin -u root password 'insert-password-here'
```

You should now be ready to install just about any LAMP application. As an example, we'll install a personal favourite: MediaWiki, the wiki software that powers Wikipedia. Wikis are great for storing just about anything, from rough notes and technical research through to that secret recipe for the Flaming Homer.

- 1 Go to mediawiki.org and download the latest version of MediaWiki (1.7 at time of writing) in to your home directory.



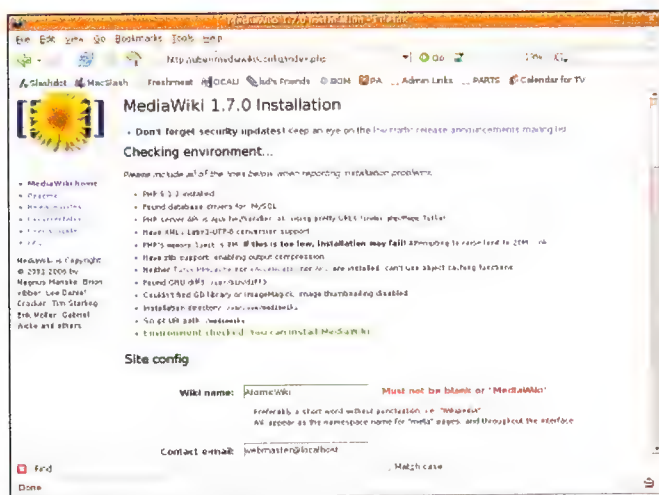
▲ MediaWiki is extracted but not yet set up.

- 2** Extract the MediaWiki tarball and copy it to your '/var/www' folder:

```
tar zxvf mediawiki-1.7.0.tar.gz
sudo mv mediawiki-1.7.0 /var/www/mediawiki
```

- 3** Allow full write permission to the MediaWiki config folder, so the installer page can write to it later:

```
sudo chmod a+w /var/www/mediawiki/config
```

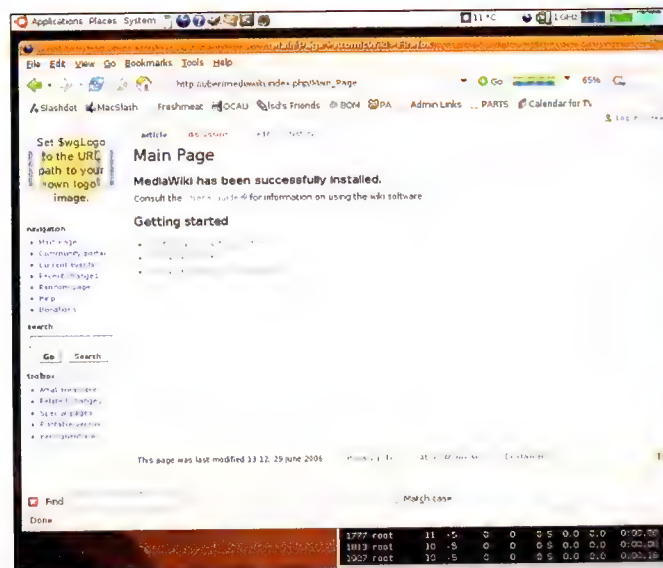


- ▲** The installer makes setup easier than a very easy thing.

- 4** Open **uber/mediawiki/** in your browser and click on the setup link to open the installer. Most of the default settings are fine, but you'll need to decide on and set a name for your wiki, enter the login details for a wiki admin user, and create login details for MySQL to use for the MediaWiki database. Enter your root MySQL password as well and click 'Install MediaWiki!'.

- 5** Once the installer finishes, copy the LocalSettings.php file it created in the 'config' folder to the root MediaWiki folder:

```
sudo cp /var/www/mediawiki/config/LocalSettings.php /var/www/mediawiki
```



- ▲** Ah, that's better – your very own wiki, ready for your ramblings.

- 6** Re-open **uber/mediawiki/** in your browser and you should see a shiny new wiki, ready to be filled with all manner of useless crap (uh, we mean vital, useful information)!

Wikis are quite easy to use – just click the 'Edit' link at the top of a page to edit its contents, and wallah! You're an author. If you want to create a new page, just open the URL you want it at and hit the edit link. Wikis have their own formatting commands, but if you need help, check the MediaWiki documentation, or just open some pages on Wikipedia and see how they're formatted.

Secret Santa

If your wiki contains sensitive information (like those world domination plans, your collection of reflecto-porn, or a shrine to Bill's ever expanding gut) that you'd rather have kept safe from prying eyes, you can have Apache prompt for a password to allow access:

- 1** Create a users file for Apache to read, and add a user called 'wiki':

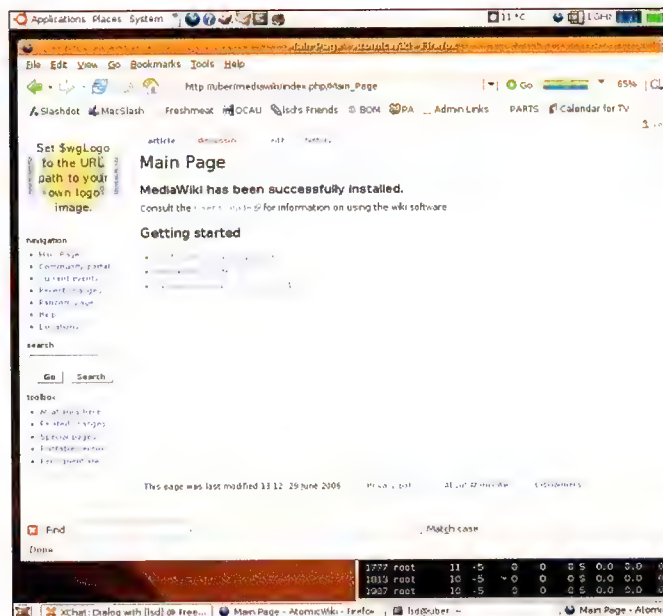
```
sudo htpasswd -c /etc/apache2/passwords wiki
```

- 2** Add these options to the bottom of your '/etc/apache2/sites-available/default' file to enable password protection:

```
<Directory /var/www/mediawiki>
    AuthUserFile /etc/apache2/passwords
    AuthName AtomicWiki
    AuthType Basic
    require user wiki
</Directory>
```

- 3** Tell Apache to reload its configuration:

```
sudo /etc/init.d/apache2 reload
```



- ▲** Now no-one can read your evil schemes, unless they guess that 'god' is your password.

The next time you access the page, your browser should open a login dialog – just enter your details and you'll be ready to go.

Next month

We'll be wrapping up the Uber Box next month, but not before looking at some of the more exotic things you can do with a Linux server, so you can squeeze every last drop of usefulness out of your penguin power.

HARDWARE TUTORIAL

Build it
and showRe-building
the beast – Part 3Ron Prouse adds the final touches to his
massive re-modding meal.

Suppliers

PC Case Gear: www.pccasegear.com

- 1x Lian-Li TR-3 silver LCD thermometer and fan controller, \$39.00
- 1x Lian-Li 80mm airflow duct kit, \$39.00
- 1x Lian-Li universal bay cover, \$14.50
- 1x Ultra X2 550 watt modular power supply, \$189.00
- 1x AC Ryan MeshX, \$27.50 50 x 50cm

Altech Computers: www.altech.com.au

- XpertVision GF6800GS Super 512MB DDR3, AGP 8x, \$399.00

Disclaimer

Whenever you pick up power tools, cutting and grinding instruments, or even a can of spray paint, you are putting your general wellbeing at risk from some form of industrial level accident. We take every precaution by wearing appropriate safety equipment, using tools with respect and within their limits, and by not inhaling the contents of glue and paint containers. We suggest that you should follow a similar regime, and seek professional assistance and guidance if you are attempting a task outside of your skill set.

NB. Atomic and staff are not responsible for your safety or longevity. Or the hair on your cat remaining one color.

1

At the end of Part 2 of this tutorial we had a completely functional PC. The only thing left to do was update the look of the outer panels, and re-work some of the original modding.

The first area for attention was to 'mesh in' a section of the left-hand side panel, so it was covered with masking tape to minimise collateral damage to the brushed aluminium finish. A template was drawn around the AMD logo on that panel (a remnant from a previous tutorial), keeping as close as possible to the area with the logo while still allowing for rounded corners on the cut-out. The sides of the template were checked for 'square' (parallel to the outer edges of the panel) and then the section was cut out using a jigsaw.

Getting a clean and straight cut in thin gauge aluminium sheet is not overly difficult, especially if you follow a few precautions. The right equipment helps, such as a pendulum-action jigsaw with a blade specifically designed to cut the subject material, but the more important factor is the method with which you use them. Support the case panel firmly, especially around the area that is being cut, and progress slowly. Keep the blade following the guideline in a consistent manner – either in the centre, the left or right edge of the cutting tip, but not a combination of all three.

Remember that there are no straight sections in a corner, so turn the blade evenly all of the way through the arc. It is also better to err on the side of caution, as you can always remove a bit more later with files or sandpaper.



2

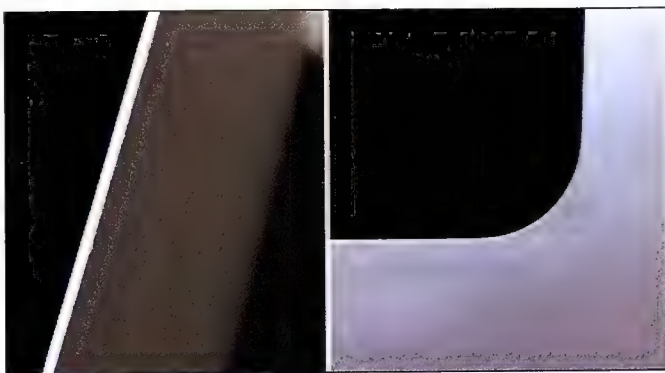
If you have taken the time to jigsaw carefully, then you will save 10 times the effort at this point by not having to file and sand out major imperfections. There is one trick that can be used to get a really pro-looking finish on rounded corners, and it is a cheap trick at that. Fabricating custom sanding-blocks is as simple as finding something with the same profile as the corner radius, and bonding 180-grit sandpaper to it with Bear Brand double-sided tape. Here, I used a 20mm PVC electrical fitting to get the right curve for the corners, and by using a purpose built sanding shape all four corners should end up being the same, regular shape. Using a large cork sanding block for the sides will help to keep them straight, and avoid waves along their length, while the bonded aluminium cut-off is used to blend the straights into the curves. A common mistake is where the corners exhibit more than 90° of the curve, creating a convex/concave bump where the curve meets the sides. This can be avoided by using a J-shaped sanding block to morph those transition points, as the curve at the front of the block will run smoothly up and off the 'ramp' of the corner radius.



3

The aim is to get a smooth straight series of sides, without any unsightly grooves or craters along the inner edge, as they will show up twice as much after painting or polishing. The curves should be smooth and flowing, without any obvious point where they meet the sides, and then all of the outer edges should be slightly chamfered – leaving the inner edges at 90° will look a lot better when the mesh is fitted to the inside, minimising any gaps along the joint. The next step is to use 1200-grit sandpaper on all of the

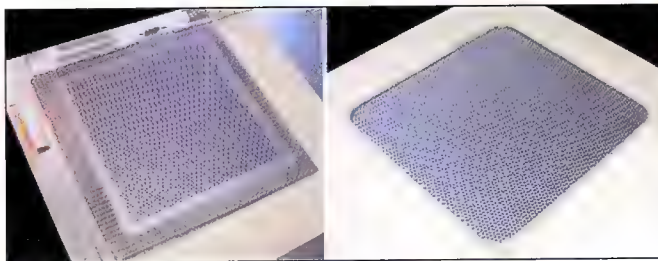
edges, and then buff them to a mirror finish with a suitable plastic/metal polish. Finally, the inside of the case around the perimeter of the hole should be sanded and wiped over with a strong solvent (such as acetone in the case of aluminium) to provide a good surface for gluing the mesh down.



4 Just like fitting a frameless window, gluing in mesh panels requires a good 20mm+ of overlap to give the joint durability – as the strength of the joint is proportionate to the surface area of the bond. In this instance we chose to use A.C. Ryan MeshX, as it really complemented the look of the modded bezel, but a word of warning – it isn't cheap.

MeshX is a painted steel mesh, about 1mm thick, so it needs to be cut with either a jigsaw or Dremel, the latter being good for more intricate cuts as this stuff is as solid as the average metal case. Cutting with tin-snips is possible, but also warps the mesh and makes it harder to use. We also found that when using a jigsaw the best result was obtained by covering the area being cut with masking tape, as it smoothed out the 'clunk, clunk, clunk' of cutting from hole to hole. After the mesh was cut to size, the edges were smoothed over and the corners rounded. Then the area to be glued was sanded back to bare metal – again, to aid in getting the strongest bond possible.

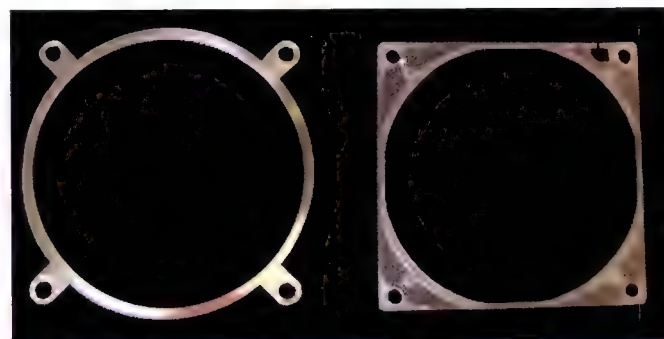
The mesh was glued to the cover using five-minute two-pack epoxy, with the glue being spread on thick enough so that once some weight was applied it squeezed up through the perforations and 'skinned' over, like a glue and mesh sandwich.



5 The side blowhole was too close to the recess that forms the rear case handle to have mesh glued on the inside, so an alternative solution was required. The first step was to cut out the centre of a stainless steel biohazard grill with a Dremel, reshape the centre and polish it as a trim for the existing 80mm hole. The screw holes were countersunk so that it



would have a flat surface when assembled. Next, a slice was cut off an 80mm fan and ground to a flat surface, so that it could be used as an inner retention plate – the plastic is PVC so it has flexibility, rather than acrylic which is brittle.



6 A square of mesh, 10mm larger all round, was cut out and the edges and corners rounded over.

The next step was to drill the four 4mm screw holes through the mesh, a task that often can become a nightmare – like when the drill-bit moves around to the nearest perforation, grabs the mesh, and spins it around and cuts off your fingers.

However, there is a simple and effective method that will avoid this bloodshed, and it involves a scrap of acrylic. After marking the position for the four holes, a 4mm hole was drilled through the aforementioned acrylic, which should then be positioned and clamped in place so that the hole lines up with the mark on the mesh, securing it and ensuring that the drill bit doesn't 'walk' around.



7 The side blowhole was now assembled, using a fine bead of silicone between the mesh and the case to stop any vibration.

The masking tape was removed from the side cover, and any residual adhesive was cleaned off with acetone. A coat of carnauba polish was then applied to give the finished item a deep lustre.

The mesh is a great match with the Lian-Li brushed aluminium finish, and permits 60 percent airflow.

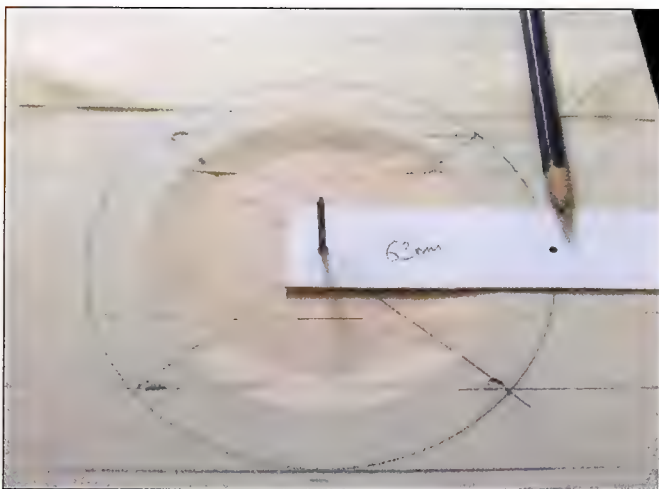
The bottom section allows air to enter the case from around the pumps and pass up through the optical and hard drives, while the upper section lets air escape from behind the motherboard. It is worthwhile mentioning that the mesh will always look better if the rows of lines are kept aligned with the axis of the case. If that is too hard to do, then use a diagonal effect as a contrast.



8

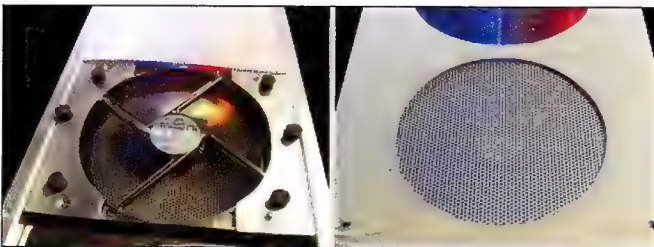
The focus now moves to the top of the case, and the repatriation of the 92mm blow-hole. As the four existing fan screw holes are too far apart to be covered by a 12cm fan, a simple replacement is out of the question, so the answer is to mount the fan to the chassis – see Part 1 (*Atomic 66*) of this tutorial – and then fabricate a meshed-in blowhole in the outer cover. After screwing a piece of timber in behind the hole, the exact centre of the notional hole is determined and a small nail driven in as the centre axis. Using a piece of heavy card, a circle with a 63mm radius is scribed onto the masked top cover.

The hole is then cut, shaped and sanded as per step two, with a sanding block made from a blank DVD stack container, 124mm in diameter, and the edges are then polished to a mirror shine.



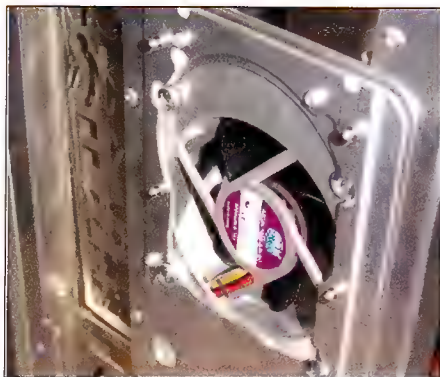
9

A section of mesh was cut to fit snugly between the chassis rails, and folded 90° at each end so that it wraps around the fan brackets. Rather than glue this mesh section in, six grommets were cut out of self-adhesive Spire case insulation foam and used to tension the mesh evenly against the inside of the top. This will stop any vibration, and keep the mesh firmly seated against the edges of the blow-hole. Initially an A.C. Ryan 120mm MeshX fan guard was fitted to the underside of the fan, but was eventually replaced with an ordinary wire grill – MeshX allows an airflow of 60 percent, which in most cases is acceptable, but a panel on each side of the fan cut the efficiency to just 36 percent.



10

The rear panel was really in need of some attention, as much of the sheet metal adjacent to the IO panel had previously been cut away to get airflow through an external radiator. The inside of the panel had been re-fabricated in Part 2 (*Atomic 67*), but the outside was



looking pretty ordinary.

The answer was the Lian-Li Air Flow Duct Kit, which is designed to work with a standard 80mm rear fan slot. The retention bracket was attached using countersunk pop rivets from inside the case, hidden behind the false interior panel, albeit the fan is nowhere near where it was meant to be. The desired outcome was to get the shroud to cover up the mess, without impacting on the airflow through the rear radiator, and it performs this task well. If watercooling performance testing indicates that there needs to be less restriction of airflow, the shroud can be cut and meshed-in later.



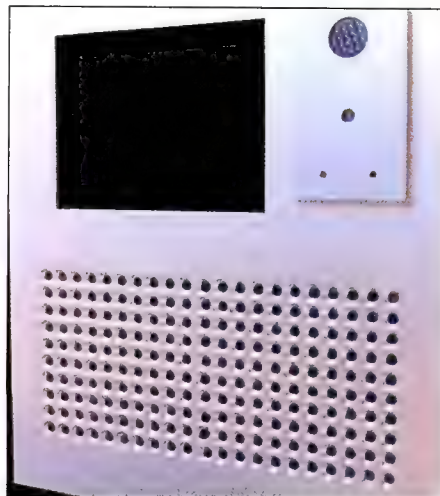
11

It was time to start on the front bezel, and the first thing to be modded was the plastic switch panel. The original rounded switch was squared up on a linishing belt, and the face sanded flat. The original power and reset buttons were also ground flat, and discs of carbon-fibre were glued to them. A section of the aluminium sheet cut out of the LHS cover was bonded to the switch fascia with epoxy glue, and any gaps around the edges was filled with automotive body-filler. Appropriate-sized holes were drilled and countersunk into the aluminium (some child-proofing measures here!), and then the sides of the block sanded and painted with flat aluminium modelling paint.



12

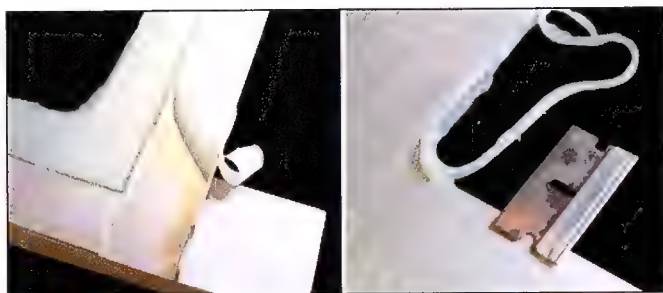
The air intake section of the bezel had two rectangles of punched air holes, and it was begging for some attention. As there is now just one 12cm fan in the front of the case, it seemed more appropriate to have a single intake grill. A new vertical row of 2.5mm holes were drilled inbetween the existing rectangles, however the gap between the original grill holes was 0.5mm less than half the gap between the rectangles – if that makes sense! Anyway, the fix was to camouflage this variation by countersinking all of the 210 holes, covering up the 0.5mm difference and giving the bezel



a whole new appearance.

The additional upside to this mod was that the airflow was increased dramatically, mainly as the 2.5mm holes ended up at 3.5mm after the countersinking bit was used.

13 Replacing the glass window in the RHS cover was next, as it had a large pirate skull logo sandblasted into it a while back. The hardest part was softening up the silicone that had been used to fit the window years ago, but it finally succumbed to a heat gun and a razor-thin fishing knife. The residual silicone was dissolved with acetone, and the new window fitted using Dow Corning 380 Glazing and Partitioning Silicone. Firstly, the inside of the side-cover was masked up around the perimeter of the glass, to stop the silicone from getting all over the rest of the cover. The cover was placed on a wooden frame, well clear of the window edges, to keep it flat and secure. A thick bead of silicone was then spread evenly around the 30mm-wide border of the window, and the glass pressed down into position – silicone will squeeze out between the glass and side-cover, but that can be easily removed later. A heavy weight was then placed on the glass, and the assembly left for 12 hours to thoroughly set. Clean up on the inside of the cover is a straight forward matter of trimming the excess silicone from around the edges and peeling off the masking tape. On the outside, the method is the same, and keeping the razor blade at 90° will give a great seal right up to the edge of the glass – so there is nowhere for dust and crap to accumulate. The final cleaning of the glass is best done with an ammonia-based window cleaner, using a razor blade to skim off any silicone smears or fingerprints.



14 The polished upper cover is less attractive than in a standard Lian-Li case, as it is covered in holes, slots and grooves that detract from the rest of the minimalist look. The aluminium plate was cut to the same shape as the inner panel, but made 35mm longer so that it covered up the rear of the FDD and ODD drives, and the pump cover was then notched so that it too mirrored the top of the panel.

The bullet-shaped cover attached to the rear radiator is the second part of the Lian Li Air Flow Duct Kit, and it was used to help conceal some of the watercooling hoses, with notches cut out so that the hoses appear to connect into it – like a chrome-plated heart, with arteries and veins branching out around the case.

The finishing touch for the window is a logo that proclaims the unique attribute within, H2Ox2! The decal was cut out of a metallic film which looks like brushed aluminium, so that it matched the rest of the case covers, and was applied on the inside of the glass. The placement, over the top of the polished aluminium covers, was chosen as the reflection gives it a 3D look although it is a subtle overall effect.

And that's it! The beast had been rebuilt, stronger than before. The artery effect, thanks to some clever watercooling, makes the case look pretty damn fantastic. Check out the pictures!



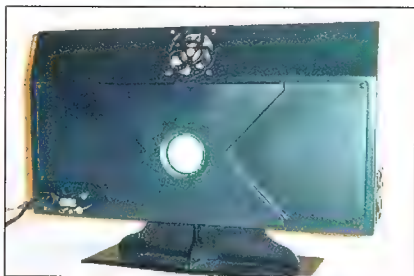
ATOMICHOTBOX

The best reader-submitted custom case mods every month

Welcome to Hotbox! Each month you'll find the winning Hotbox of the month and runners up as voted for online at www.atomicmpc.com.au. Want to win? Submit your box now!

RUNNERS UP ▼ RUNNERS UP ▼ RUNNERS UP ▼ RUNNERS UP ▼ RUNNERS UP

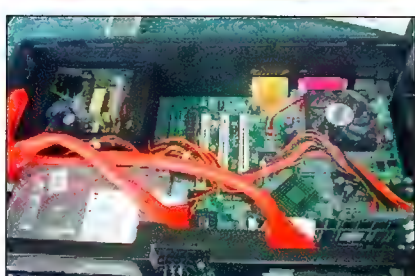
Cary's Xbox Mod ▼



technical details

- Xbox console
- Samsung SyncMaster 173v LCD
- Creative SBS260 PC speakers
- X2VGA VGA box
- 60GB hard disk drive
- DVD-ROM drive

Matt's HTPC ▼



technical details

- AMD Athlon XP 1800+
- MSI MS-6378 V3
- 128MB PC133 SDRAM
- Integrated 8MB video card
- Onboard audio
- 250W small form factor PSU

M1K3Y's m0n3y p1t ▼



technical details

- Athlon 64 3200+ @ 2.33 GHz
- ASUS A8V Deluxe
- 2x 512MB DDR400
- Sapphire RADEON 9600XT 256MB
- 120GB Hitachi Deskstar
- 3x CC UV tubes

hotbox OF THE MONTH

HOTBOX

Edvuld's Temple of NOD

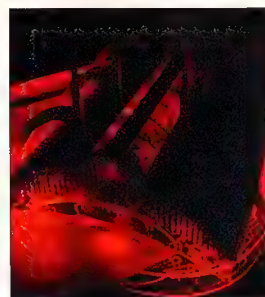
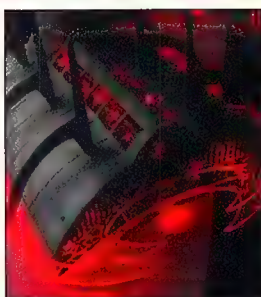
The plans for this project started a few years back. I wanted to build a case really different from the ones that the masses had (isn't that why we all do this?). I came in to think about the Temple Of NOD from the great RTS game Command & Conquer, and I realised it would be a shame to let its cool design be forgotten. Who doesn't remember laughing in a sinister way when you were building the Temple of NOD to get access to the nuke? I did this as a tribute to C&C, one of the first games I ever played. The worklog can be found here: forums.bit-tech.net/showthread.php?t=97347

Edvuld



technical details

- Intel Pentium 4 3.0GHz @ 3.6GHz
- 2x 512MB DDR400
- Sound Blaster Audigy
- Sapphire RADEON X800 PRO VIVO Toxic
- Matrix Orbital
- 550W TruePower PSU



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- 3-4 high resolution, well lit, pictures.
- A 250-word description of how you made it, the obstacles you overcame, the tools you used, and your inspiration.
- A detailed list of the machine's specs.

Hotbox of the month wins a **Gigabyte GA-G1975X!**

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- SATA 3Gb/s, RAID
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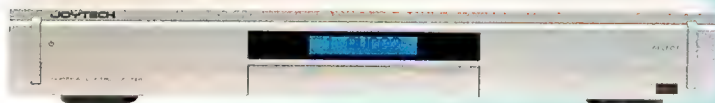
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- 4 Optical Inputs
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- Optical
- Ethernet



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GAMEPLAY

GAMES, GAMING AND GAMERS
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Hold your fingers up in front of you. All of them. That's it. Now for the sake of the argument we'll include thumbs as fingers. Done. How many do you see? Ten? Perfect. I apologise if you've less than 10 for whatever reason and this experience made you recall something horrible.

So today's number is 10. With that big 10 hovering in your mind's eye, please enjoy our game reviews section, which scores out of 10, just as our hardware section does.

Now, a simple mathematics refresher. To get to 10 you start at one. Not seven, like you'll find elsewhere on the newsstands and online. But one. Please allow me to give you some real-world, plain-English examples of just how these numbers translate into game review words.

'Five', as an example, in Atomicpeak, means 'average'. It does not mean 'awful'. 'Two' means awful, while 'one' means 'abysmal', or 'atrocious'. Or any other word you care to think of that describes something as bad as bad can be.

To *Atomic*, review scores run from one to 10, not seven to 10. *Atomic* reviewers are well aware that it is accepted convention for almost every other games review site or mag to score only between seven and 10. But screw them and screw that. We're not going to play the silly game of giving seven to an average game, when that seven intentionally means different things to different people.

Sadly, and uselessly, a 'safe seven' to the reader, means 'quite good'. So you go and buy it and are disappointed. To the writer, it's a corny 'I hated this game but am too afraid to say so in case it turns out that everyone else loves it'. And lastly, a safe seven means that the game publishers are not unhappy.

Average games, here in Atomicland, get five, and you can be sure we'll explain exactly why we feel that way. Good games get a seven, great games a nine and very, very occasionally you'll even see a 10, which carries and accepted definition of 'perfect'.

Reviewing games should be an objective process, and it's only with loads of experience appraising games that one is able to give a proper objective assessment, and to be able to see exactly where in the big picture a new game fits. It's not scientific, and it's unavoidable that at least a little subjectivity creeps into the process, but we do try.

I hope that helps you understand where we stand with scores. Remember please to not just look at the score though, read the review for the full picture, and by gum, if there's a demo, play it for yourself so you get a clearer idea of where we're coming from, having most likely finished the game ourselves. 7/10.



Ben can count to 10.
ben@atomicmpc.com.au



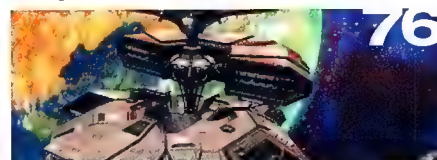
Scanner

We bring you gaming news, and **Kate Inabinet** speaks up for a change in Vader's pitch.



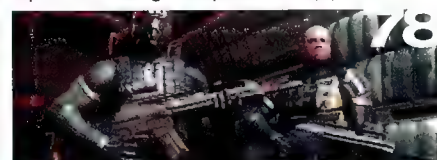
Talking Head

Big is beautiful, says **Logan Booker**, and he's talking 20 inches of big.



Pipeline

Check out which games are currently being squeezed through the production pipe.



Engine Room

Logan Booker heads back into the jungle to confront Crytek's latest, *Crysis*.



Prey



Dreamfall



Forbidden Siren 2 **CivCity: Rome**

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short circuits



Yes, that's the new Team Fortress.

What's this? Team Fortress 2 is on the way? Unbelievably after many, many years resting dormant at Valve, the sequel to one of the most popular team multiplayer mods will finally see the light of day in Half-Life 2: Episode 2. There's even screenshots!

Looks like Neverwinter Nights 2 has been pushed back from a September to October release. Whether a strategic move by Atari to position the title closer to Christmas or to give developer Obsidian some more time to polish, we'll be waiting an extra month for this much anticipated title.

Microsoft is reportedly a little nervous about the success of the Xbox 360 in Japan. Unsurprising considering the original Xbox didn't do so well over in the East. Compounding the problem of course is the upcoming launch of the PlayStation 3, which has historically done exceedingly well with Japanese consumers.

Mark Rein of Epic has publicly denounced episodic games, claiming it to be a 'broken business'. We guess only time will tell if Mark is right – currently Valve seems to be doing okay with Half-Life 2: Episode 1, and it has proven that online distribution has potential.

Textbook strategy

Ben Mansill gets medieval with Creative Assembly's Dan Toose.



Creative Assembly's Total War games have an almost fanatical following, and deservedly so. The 'turn based-strategy, meets real-time combat' games are famous for their depth, as much as they are for bringing life to historical scenarios.

The most recent game, Rome: Total War, and its add-on Barbarians, had us all flinging burning pigs at Hannibal's elephants, learning about and loving the period whether we knew we were history fans or not.

Getting the history right in these games has become an expectation from fans, and the heat is on for Creative Assembly to deliver in its grandest game yet – Medieval II. We caught up with Dan Toose, designer on Medieval 2, to talk about making history fun.

Units in the game must look and act as accurately as possible says Toose. 'Obviously

with over twenty factions in our game, we need a lot of research material. That basically involved buying an absolute horde of material that goes into great detail about the makeup of armies from all around the world, throughout the entire period.'

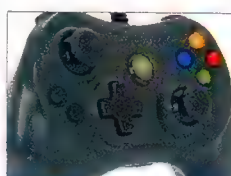
Field research is the next step, Toose explains. 'After researching the units we're including in the game, we then go and talk to people who have not only researched the period themselves as well, but are also actively involved in live medieval combat re-enactments. They tell us things like how each weapon was used, the correct stance to wield it, etc. We actually record them using the weapons.'

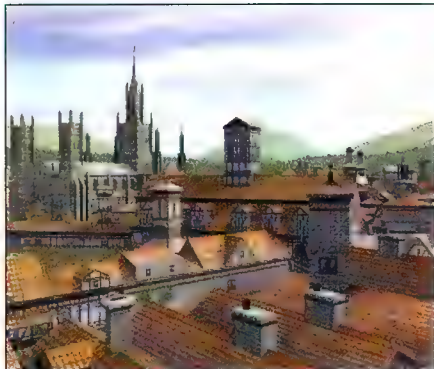
Polishing the final detail and getting it right in the game is the critical phase, says Toose. 'We then also do additional research, with really specialised

texts like *Secrets of German Medieval Swordsmanship* that fully illustrates and names



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the actual fighting techniques taught to folks like the Zwei-Hander units in Medieval II. Finally, we hire professional motion capture actors, and have them follow the script of physical movements we've collected.'

Creative Assembly has worked to make the gameworld itself as detailed as possible, within practical reason and without compromising gameplay. 'We bought many texts that detailed European, Islamic and Mesoamerican architecture. We bought many texts that detailed the actual floor plans of fortresses and street maps of medieval cities. There's a certain amount of 'gameyness' that we need to deal with when reproducing these to create interesting sieges, but we definitely work on getting things right such as an organic look to the planning of roads, and at least the external features of all the buildings themselves.'

How far will Creative Assembly go to ensure historical accuracy? 'I did go as far as trying to learn where the boundaries of forests were in Germany throughout the Middle Ages, although that drew a bit of a blank... Probably because nobody in the period ever imagined a world without forests everywhere.'

Medieval II is due later this year.



geekette

A girl's eye view of the gaming world.



How many times have you been playing that pretty Elf Druid on your MMORPG and wished that if only people could see past the burly construction worker that your voice belies, and actually believe that your lovely Elf might be the sexy teen American biscuit that you imagine she is? Like totally.

Wish no more. Audio4Fun has come up with what it calls the 'AV Voice Changer' that allows you to adjust the pitch and timbre of your voice so you can sound however you like via your Skype headset. The product has been touted as the new wave in gaming for girls who are afraid to let their real life gender interfere with their playing. As opposed to simple online chat where unless you accidentally type 'I am a girl' it is unlikely anyone could tell. Now their pesky soprano can be cunningly disguised as a booming bass, leaving them free to play in peace.

Previously reduced to wearing our Darth Vader Voice Changing Helmet while be-Skyped in an attempt to ensure our gaming is devoid of gender revealing ramifications, this product has hit our shelves not a day too soon! Heaven forbid what might happen if after all this time someone finds out that my male character has actually been manned – so to speak – by a girl. A cootie infested, frock wearing, romantic comedy loving, friend of Naomi Wolfe.

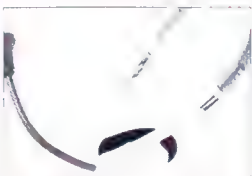
No doubt this revelation would be swiftly followed by petitions demanding I be removed from my guild, my character's name added to the Kill On Sight forums, and the boys simply refusing to play with me. Forced to hang in a circle of other exiled women, who in all likeness were probably just boys pretending to be female in order to chat to girls in the first place.

Apart from the obvious attraction for Internet predators, prank callers and those who would prefer to sound like their ex-mother-in-law when they phone to give instructions for a ransom drop, the unit holds genuine interest for people who take their role playing as seriously as their command of the Klingon language. This product allows for total immersion into the character and their online community.

Unless we really do want our Elf to sound like Cher from *Clueless*, the rest of us can get by doing what every other MMORPG gamer does, regardless of whether they are trying to disguise age, sexual preference, or gender. Just play as best we can and let people judge us on the skill our character brings to a group, rather than our auditory resemblance to James Earl Jones.



Kate Inabnet is currently an Animator at Blue Tongue. Prior to games development, Kate spent six years in advertising and short film. She studied at the AIE in Canberra where she is still involved as a mentor for the Women in Games Pathway, presenting regularly at conferences on the topic.



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TALKINGHEAD

Logan tells you everything you need to know about gaming



Wide world of screens

Logan Booker wants more inches on his desk.

Something inside me yearns for a bigger monitor, a great big mega-inch LCD screen so fearsomely proportioned you could beat King Kong senseless with it – if indeed you could wield such a massive device in your tiny human hands without the aid of a cybernetic endoskeleton or one of those Roger Ramjet pills. There was no practical motivation behind my big screen yearning, just a raw desire that burned in my belly, as if I'd swallowed a spicy translucent meatball that was in actual fact a globule of molten glass.

Pill-popping cartoons and death by melted quartz aside, I've been stuck with a dinky 17" flatscreen CRT for as far back as I can remember. In fact I bought it so long ago replacement cogs are impossible to come by and the only remaining service centre is a giant barn in a village somewhere in Taiwan.

Considering 19" is the absolute bare minimum size you should get these days unless you're prepared to be kicked in the street by random people, and LCDs have come down significantly in price since the days of my 17", now is the time to go shopping for a new screen. Thus, I sat down in front of my PC a few weeks back and started assembling a list of screens that tickled my eyeballs.

After visiting the websites of many, many LCD manufacturers and permanently damaging what little vision I have left, my shortlist consisted of four suspects – the Dell 2005, Samsung's 215TW and 930BF and Viewsonic's VX2025WM. (No doubt by the time you read this, upgraded versions of all these models will be available.)

A quick consultation with my fellows on longevity and features saw the 930BF cut. It's a great panel (in fact, we recommend it in Kitlog), but I was quietly informed that those nasty black bars on the top of all my movies *weren't supposed to be there*, and that widescreen was the way to go. A glance at the Dell 2407 in Labs confirmed this fact.

With the 930BF gone I considered Samsung's other panel, the 215TW. Again, another top notch monitor worth every cent you pay for it. Unfortunately, I didn't exactly have every cent. In fact, I only had half. I cried a little as I scratched it off my list and moved onto the Dell 2005.

Again, a brilliant panel, but still too pricey for my meagre budget.

Things were getting a bit desperate and it was becoming apparent that my \$500 or so limit wasn't going to get me much in the way of 21"+ screens. It was with a sizeable portion of glee that I then examined the specs for the VX2025WM and found it to be pretty darn close to the price I wanted to pay.

20 inches, widescreen and an 8ms response time – just right for games. The stand's not adjustable, but otherwise it had the makings of a bargain. For the first time since I set out on my quest for more inches, everything felt

right. So there I was ready to purchase, when a passing comment from a workmate almost made me slit my wrists with the edge of my credit card.

'Hey, why don't you get two screens?'

The genius of the comment took a few moments to set in, most of those occurring as I reached for my wallet to commit consumer-cide. Once the idea had settled, though, it took little time for the 930BF to sneak back into my head. Or should I say a pair of them. Side-by-side, they'd make a formidable piece of screen real-estate. Well, not a piece, more a team... if there's such a thing.

But I needed widescreen! Blast and damn, I cursed in my head. Somehow – probably through the early symptoms of dementia – I offended the maniacal part of my brain and in response it made a completely insane suggestion. Two. Widescreen. LCDs. Harmony once again reigned. My final choice wasn't a lost cause, and my selection of the 20" Viewsonic

was sound – I just needed to buy more than one. And that folks is what I'm now saving for – a glorious set of VX2025WMs.

That's of course if the 17" flatscreen doesn't get to me first.

Logan's lacking in inches, but he's okay with it, despite his sad face.

lbooker@atomicmpc.com.au



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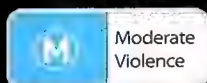


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Release Date **September 2006**

Darkstar One

Aside from the X series, the space sim genre has been rather quiet for the past few years. Actually, scratch that – it's been as silent as an empty casket buried in the middle of the desert a thousand years after an all-out nuclear war.

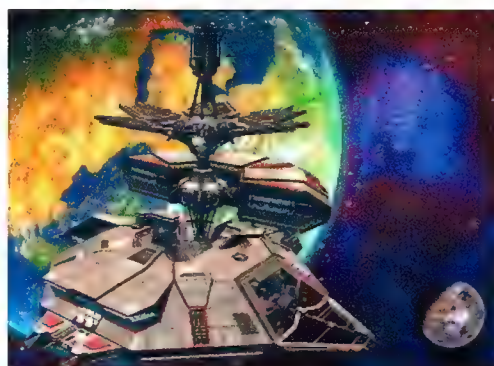
Enter Darkstar One, Ascaron Entertainment's attempt at boldly going where no man has gone in, uh, quite some time.

Ascaron hopes to recreate the sense of freedom players had in games like Elite, but at the same time it wants to provide a clear sense of direction and purpose. What this translates to in gameplay terms is a situation that's remarkably similar to Grand Theft Auto. There will be a series of relatively linear, story-driven missions, as well as dozens of optional side quests that can be completed for extra cash.

The quests will involve things like bounty hunting, piracy, smuggling, trading, escorting and ferrying passengers and cargo from one place to another – everything you'd expect from a good space sim.

The cash earned from these jobs can be used to purchase upgrades and better weapons, which will no doubt come in handy as you explore some of the more anti-social parts of the galaxy. Controversially, players will only have access to one ship in the game, though Ascaron assures that the unique RPG-style ship upgrade system will guarantee replayability and extensive customisation. We're not so sure about this, as upgrading a new ship throughout your travels is the best way to inject freshness into a game that's essentially about zipping around empty space for weeks on end.

While Darkstar One could very well end up being just another obscure title that barely deserves a spot in the trashiest of bargain bins, there's a reasonable chance that it could be a worthy addition to a practically dead genre. Fingers crossed, folks.



GAME INFO Platform **PC** Publisher **CDV** Developer **Ascaron Entertainment** Website darkstarone.ascaron.com/gb/gb_darkstarone/home/home.php

Release Date **Q4 2006**

Microsoft Flight Simulator X

It feels like Microsoft's cunningly-titled Flight Simulator series has been with us since the dawn of time. Well, actually it's been closer to 25 years, but those 25 years were far more important than the millions of years of so-called evolution, if you believe in that sort of thing.

Microsoft is hoping to attract a new generation of fans with Flight Simulator X. Aware that some gamers found the previous titles a bit boring, it has decided to introduce a single player 'campaign'. While Flight Simulator games have always had 'landing a 747 in the rain with one engine'-type challenges, the missions in X promise to be far more interesting. They'll see you performing tasks such as piloting rescue helicopters, flying food into third world countries and competing in plane races.

If you're not in the mood for following orders, you'll still be free to explore the globe in one of the 24 aircraft. Microsoft promises that the in-game environment will be more detailed than ever before. There will be 24,000 airports, some of which will have interactive elements such as fuel trucks and baggage carts. Thanks to the wonders of GPS technology, Flight Simulator X will include accurate road and town layouts – meaning, in theory, you'll be able to find your home and buzz your mum while she's weeding the garden. The streets will also have traffic. Heck, if you fly close enough to the ground you'll even be able to see dolphins splashing around in the oceans and lions trotting about on the African plains.

The promise of some proper single player missions and jaw-dropping graphics has us salivating. Okay, maybe not, but Flight Simulator X is definitely worth keeping an eye on. Naturally, it'll be touching down in stores at Christmas.



GAME INFO Platform **PC** Publisher **Microsoft** Developer **ACES Studio** Website www.microsoft.com/games/pc/flightsimulatorx.aspx

Release Date Q1 2007

Supreme Commander

If you're a fan of Total Annihilation, there's a good chance you know about Supreme Commander already. After all, it's only the long overdue follow-up to what many consider to be the best real-time strategy game of all time.

Supreme Commander has a completely new plot, unrelated to TA. It involves three forces – the Aeon Illuminate, the United Earth Federation and the Cybran Nation – who've been at each others throats for a thousand years, successfully trashing countless planets and systems in the process. Sure, it's bog-standard sci-fi fare, but how many people can honestly say they'll be playing this game for the story?

While they are all human, the three forces are quite distinct from each other, both in terms of technology and their ideologies. The Aeon Illuminate, for instance, enjoys fooling around with alien gear and hovering vehicles – a far cry from the United Earth Federation, which prefers to stick to more traditional wheel and track-based vehicles. The third side, the Cybran Nation is all about cybernetics and has a far more balanced approach to battle.

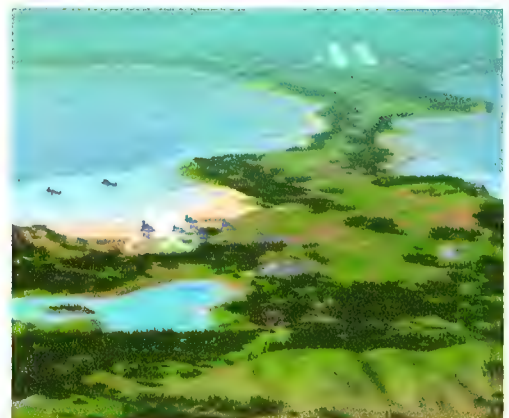
Supreme Commander can be summed up in one word: scale. The maps are simply massive. Gas Powered Games has stated that the largest are 6400 square kilometres in size. While maps in other strategy games might be set in a single forest, maps in Supreme Commander will have several forests and maybe even a large body of water.

This sense of size will carry over to the units as well. Gas Powered Games has promised tanks, robots and air vehicles that are positively gigantic. And yes, these screen-filling behemoths will still be able to fit in a transport ship.

So you can keep track of everything, you'll be able to zoom out until even the largest of units is merely a pinprick of colour. Seriously, this game is big. It's huge. It's skull-implodingly large.

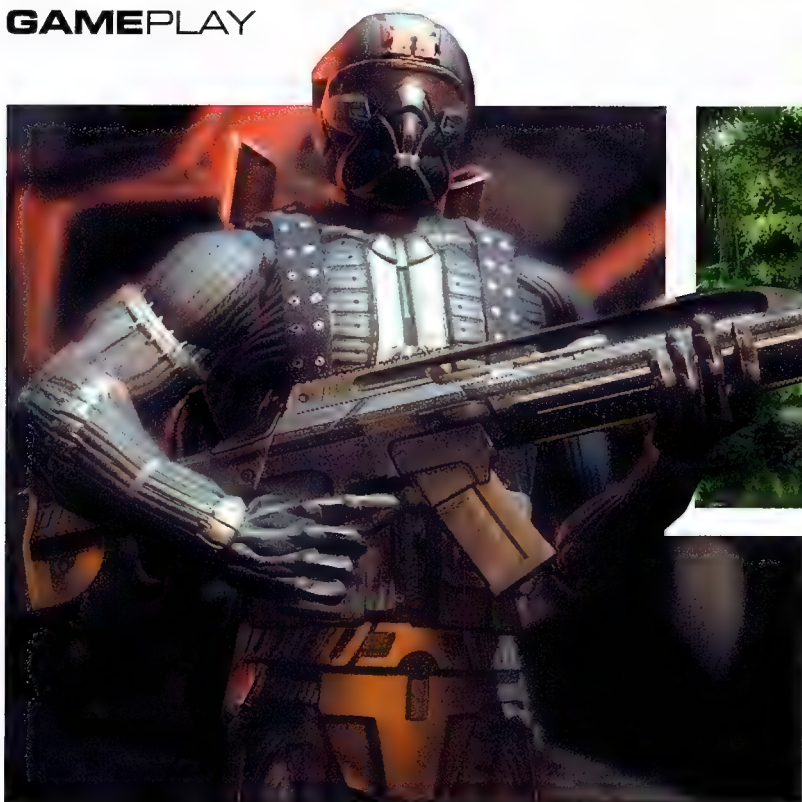
There will be no fog of war in Supreme Commander, but that doesn't mean you'll always be able to see the enemy. Quite the opposite, in fact. Gas Powered Games says recon will be very important in this game. It won't simply be a case of using scout planes and setting up radar towers, though – cunning foes will be able to tamper with your sensors, just as you'll be able to play funny buggers with theirs.

Fans of Total Annihilation will be pleased to hear that the Commander is back. This time, you'll be able to order him to automatically rebuild all or part of your base if it's destroyed. And just like in the past, he'll be able to capture and reprogram enemy units and factories to do your bidding. 'We can't wait' is the understatement of the millennium.



PIPELINE

GAME INFO Platform PC Publisher THQ Developer Gas Powered Games Website www.supremecommander.com



Frozen paradise

Logan Booker warms up to Crysis and defrosts some facts on Crytek's latest first person shooter.

In many ways, Crysis looks like the Far Cry we know and love. There's the verdant jungle packed full of places to go, people to shoot, vehicles to drive and sharks to place in awkward positions; the story is a fusion of just the right amounts of reality and sci-fi; and the graphics... well, the graphics have to be seen – and *experienced* – to be believed. Crysis was easily the most luscious game on show at E3 2006; a diamond of a title way above much of the exhibition's notorious fluster.

It's just one of a new breed of more intelligent and engaging shooters, the genre already borrowing much from its fellows. Role-playing elements are close to a standard feature now, with everything from permanently increasing the player's maximum health in FEAR through power-ups, to Boiling Point's full-blown RPG implementation, complete with drug addiction and bleeding simulation.

Crysis is no exception and we simply had to corner senior game designer Bernd Diemer and R&D programmer Martin Mittring to quiz them on Crytek's ambitious new project.

Crying out loud

Diemer explains that Crytek, fresh from the Far Cry experience, was eager to start working on its next game. While the team was confident about staging the title in a jungle setting, there was a strong desire to forge ahead with a new intellectual property; to create an expansive, vibrant world much like Far Cry.

'[We] had a concept artist overdraw a jungle picture

with snow and ice. This started the "What if..." process that evolved into the concept for Crysis. In fact, for a long time the working title was "Frozen Paradise".

According to the Diemer, the team was eager to deliver more to Far Cry's fan base without deviating too much – to keep the original game's feel but expand on its scope.

'We wanted to surprise our fans as well,' he says.

And indeed the story shares little with the developer's first game. Set in 2019, the player controls Delta Force operative Jake Dunn who, like any futuristic Spec Ops guy, is armed to the teeth with an array of high-tech toys, including a special Nano Muscle Suit that puts Gordon Freeman's HEV to shame.

After a meteorite crashes into an island in the South China Sea, the US Government sends Dunn's team to investigate. North Korea is already on top of it however, and the team has little choice but to load up and infiltrate. What follows is an involving, original story, with plenty of gunplay, freedom and interactivity – not to mention a delicious journey through the best visuals modern graphics technology has to offer.

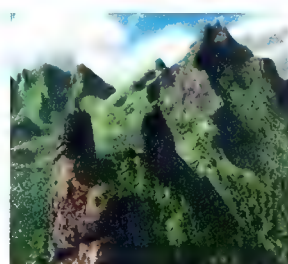
Veni, vidi, vici

According to Crytek, Crysis unravels its plot in three sections. The first has the Delta Force team carving its way through North Korean forces to check out the meteorite. As Jake, the player has numerous options available to progress, be it stealth, strategy or all-out devastation.

'Crysis improves on the Far Cry model of open, non-linear gameplay where the player has the choice how to overcome the challenges in 'Action Bubbles', as we call it. Every bubble usually has multiple paths the player can choose from, with a focus on tactical and stealth gameplay,' explains Diemer.



The graphics are like Far Cry, but better. Like, way better.



Crysis takes graphics to the next level, adding support for sub-surface scattering to create realistic skin. Look at how it all comes together!



'Outsmarting the enemy is the way to play Crysis, instead of reactive run-and-gun gameplay. We call this type of design 'Veni, vidi, vici' ['I came, I saw, I conquered'] which means the player can approach the situation, view and gauge for himself how to tactically defeat it and use the tools available to conquer it.'

And conquer you will, until your Delta Force team reaches the meteorite - that's when part two of the game unfolds. From the extraterrestrial rock emerges an alien craft that immediately encases itself in a shell of ice, freezing everything in its vicinity. Thanks to his suit, Jake's protected from the effects - but that doesn't make things any less dangerous. The world inside the ice shell is a fragile one, a few bullets enough to shatter

the frozen objects within. From here, the suit plays a huge role in protecting Jake, who can use its abilities to defend against the invaders. If that wasn't enough, the protective shell will disrupt natural weather and global conditions, so don't be surprised by the odd earthquake, tsunami or tornado.

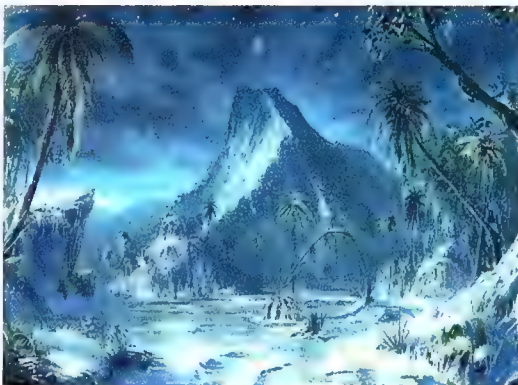
The Nano Muscle Suit (also called the Nano Fibre Suit) is perhaps the most interesting aspect of the new

'... We managed to set a new standard with our E3 demo: From now on, every jungle in a game has to be destroyable.'

game. Similar in function to the 'feral abilities' in Far Cry: Instincts on Xbox, the player can choose to expend energy to achieve various superhero-like effects.

'Taking inspiration from the Future Warrior 2020 program, we developed the Nano Fibre Suit that can enhance strength, speed and armour levels. The player can max the speed to dash across an open field, change to the strength setting and silently punch out a sentry,' says Diemer. The suit will also reportedly feature stealth options and an emergency 'shockwave' weapon when things get too tough.

Taking a page from THQ's Stalker, weapons can be customised to add that extra little something. According to ►



Each section of Crysis plays differently to the last. Inside the ice dome, a single bullet can shatter just about anything.



You won't find forests more gorgeous than this in a current-gen game.



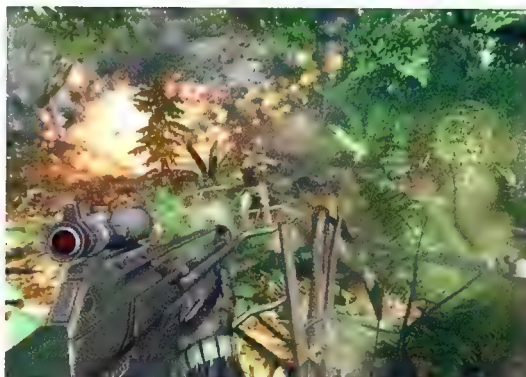
Diemer, every weapon in the game will feature a 'rail system' that can accept a silencer, flashlight or scope. There's also 'Tactical Bullets', or smart rounds that can knock enemies out, track them and even pack small charges that can be remotely detonated.

'All customisation is done on the fly without stopping the game,' says Diemer. We did say Jake had a lot of high-tech toys, didn't we?

Freeze frames

Crysis will be powered by Crytek's latest revision of Far Cry's CryEngine. The developer has done some serious work to the technology to push it above and beyond anything we've seen previously. Destructible forests, deformable flora, dynamic lighting, day and night cycles, motion blur... CryEngine 2 packs plenty of graphics power.

'We heavily changed the engine - we removed some legacy support for older graphic cards, made the whole lighting dynamic (no lightmaps, moving sun) and support soft shadows everywhere (removed stencil



shadows). Extensive HDR [High Dynamic Range] support is now integral part of the production. Our animation system features more realistic animation and as it is now GPU based it allows much more detailed high poly characters,' explains Crytek programmer Martin Mittring.

Although legacy cards won't be supported, Crytek has been smart and is using Shader Model 2.0 as the baseline. 'This is more a production decision as Shader Model 2.0 defines a good feature set. Almost all effects can be done with this feature set but newer cards allow special optimisations,' says Mittring.

Perhaps the game looks so great because Crytek decided to aim high - photorealistically-high in fact. So, along with skin and cloth support (yes, they'll be there), expect Crysis to be a dynamic and consistent world complete with 'sky, stars, shadows, clouds, ground fog and volumetric fog all with a moving sun'.

With realism such a priority, physics has obviously been an important consideration. Crysis will make use of multiple CPU cores to handle this load. It wasn't made clear if AGEIA's PhysX would be supported, however Diemer

EMBRACING DIRECTX 10

Crysis is probably the first game we've heard of that's being developed for both DirectX 9 and its Vista replacement, DirectX 10. The new API has been a hot topic of late (although we covered all the important stuff way back in issue 59) we couldn't help but ask Crytek what the deal was with Crysis.

'The game is being developed with both DX9 and D10 as our target platforms. While we will push the state of the art with DX9 as far as we can, for the best and richest game experience, a DX10 system will be beneficial.'

With all that deformable flora, we're pretty sure DX10's Geometry Shader, which can work on entire primitives (lines and shapes instead of single vertices), will get a good workout in Crysis.



and Mittring did say it was a 'very interesting topic' and welcomed the hardware support for physics.

Of course, Crysis' deformable flora and destructible environments have garnered the game a lot of attention. While we've seen the latter before (albeit poorly implemented) the former will be a first for an FPS.

'The deformable and destroyable vegetation is a key gameplay feature in Crysis. The movement of the foliage is detected by the AI, so hiding in bushes just became harder,' says Diemer.

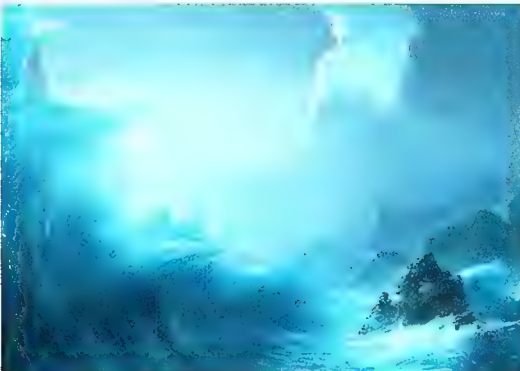
According to Crytek, entire tree lines can be mowed down with the right amount of lead and smaller pieces of vegetation can be knocked clean over. With the jungle falling down around you in heavy engagements, it's just another danger – or tactical opportunity – you'll have to consider. It's not too bad for the immersion factor either.

'This makes the concept of cover in the jungle very dynamic and the combat experience is incredibly intense. I think we managed to set a new standard with our E3 demo: From now on, every jungle in a game has to be destroyable,' says Diemer.

Beyond the ice dome

Far Cry was famous for its modding abilities and Crysis will be no different. Incorporated into the game is a new version of Crytek's level editor, Sandbox 2. It's the same tool the team is using to make the game, and allows modders to change just about anything.

'We have already selected two [community] teams that are working on mods with us, giving us feedback on how to improve the editor,' says Diemer. 'New features include a graphic scripting tool, a character editor and a tool to make in-game sequences.' That last addition should make



SOFT VERSUS HARD

To add even more realism to Crysis, Crytek has replaced the hard shadows found in CryEngine with soft shadows for CryEngine 2. The difference between these is that hard shadows are treated as just 'on' or 'off' – basically something has a shadow or it doesn't. Hard shadows are generated via the stencil buffer, which simply occludes an area leaving a hard-edged black shape. A soft shadow on the other hand requires the engine to calculate the area completely blocked, and partially blocked, by the light source. With these values, it can 'soften' the area between them and create a more realistic shadow. As you might have guessed, this technique is computational expensive and hence most games that support soft shadows, like FEAR, only recommend it for high-end PCs.

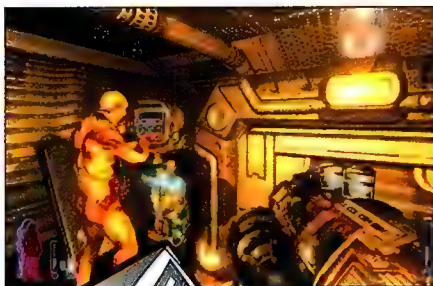
in-game cinematics much easier for modders, and of course, machinima fans will welcome the news.

Even with the progress that's been made in this area, and the game in general, Crysis is still set for a release in January next year. Getting everything just right, including the AI, will be an important task for the team.

'One of the greatest challenges was making the AI understand the dynamic environment, for example falling trees. Before we taught the AI that this can be a danger, they would just stand there and ignore a big palm tree falling over right next to them. So you could mow down a forest around a guy and he would just stand there right in the open,' explains Diemer.

It's the little details like this that will secure Crysis its place as the best FPS of 2007. And the awesome features like customisable weapons, a suit with super abilities, oodles of freedom and graphics you'd sell your hands and feet for should help to put this at top of everyone's watchlist.

Even the concept art is fantastic!



Developer **Human Head Studios**
Publisher **2K Games**
Website www.prey.com

Recommended
2GHz CPU; 512MB RAM; 64MB DX
9 graphics.

VERDICT



Uses Doom 3 engine so it'll run fast; gives you a taste of your favourite games.



Too much slow and no go; laying waste to an alien space base has never been less fun.

SCORE

5.0
OUT OF 10

Don't be scared by all those evil machines harvesting humans – you can't die anyway.

Prey

Ben Mansill thought that slaughtering alien hordes was supposed to be fun.

This is an FPS with a Rubik's Cube twist. An upside down, inside out spaghetti of portals and new, improved gravity-that-only-Escher-would-feel-comfortable-in, and Einstein would be able to figure out. Prey pulls in every trick in the 3D book, and laces it with every cliché in the gaming book.

It is part Quake 4, with methodical slogging through a dark alien base, lit only by spiny plasma devices, extending bridges that go 'zing' and evil machines inflicting tortuous suffering upon captive screaming humans. It is part FEAR, with sudden shocking appearances of ghostly children with evil intent and echoed laughter. It is part Matrix, with flying, robotic, tentacled hunters with multiple eyes, and an endless array of evil machines harvesting humans in biomechanical pods. It is part Doom 3, with baddies spawning not just behind you, but above you too, from portals that have opened just to drop a bad guy right where you're not looking.

And against this overdose of clichéd, dark alien evil, it is part Turok, with its almost comically daft trailer park Indian, bestowed with the power of the spiritual ancients when all he wants to do is find his gal.

Prey often feels overwhelmingly inconsistent as a result. It's not feature rich – it's element overloaded. In trying to break into new brave design ground with Prey, the mish-mash end result is a game world that feels like it was designed by a committee that couldn't agree on anything, and conceded to everything. I don't think there was a strong leader on this team.

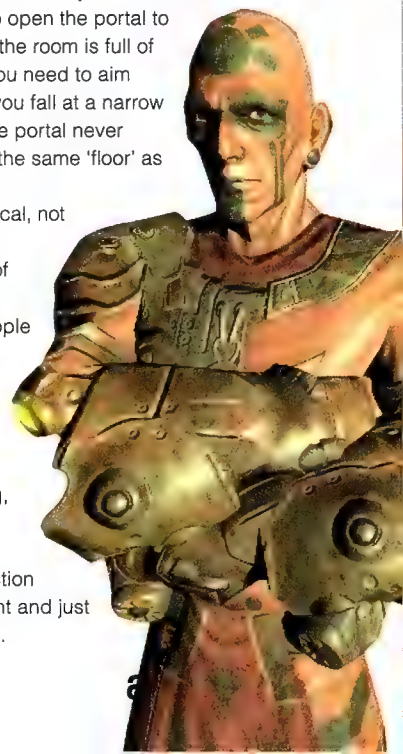
Ultimately it's a puzzle game, and a damn frustrating, funless one at that. Combat is

infrequent, and never dangerous, as you can never die – you just keep re-spawning after an odd sequence in Trailer Park Indian Heaven each time. Once you clear a room of the three or four baddies you can expect in it, you'll spend the next few minutes (or much longer) trying to figure out how to get to the next room.

For example: Imagine a room with a small panel on each of the six surfaces (Prey teaches you to think multi-dimensionally). Shooting a panel will make the room rotate once in a certain direction. Each panel makes the room rotate a certain way. The puzzle is to spin the room just-so, so that you can reach the switch to open the portal to get out. But the room is full of pipes and you need to aim yourself as you fall at a narrow pipe, and the portal never appears on the same 'floor' as you land on.

It's diabolical, not at all fun and typical of a Prey room.

Some people may praise Prey's innovation and its 'outside the box' thinking, but I found it tiresome, devoid of action or excitement and just plain not fun.



Dreamfall: The Longest Journey

Dreamy **David Kidd** goes on the shortest, longest journey ever.



'Get out of bed ya lazy bum!'

Never has a gaming genre suffered such a slow death. At one point, adventure games were the hub of gamers, spawning sub-genres, and straddling the camps of light gamers and hardcore puzzle-solvers alike. Now, adventure gaming has become a niche genre, with less titles released each year, and only a few standout titles released in the last decade – not even the great *Myst* could keep pace.

By peeling back the layers of the adventure game, it's easy to see what makes a good one, and conversely, why adventure games continue to go wrong. The first component of a successful adventure game is the story, where a well-paced tale and great dialog is essential. The second key component is interactivity – or in other words, the bits in the game that make it not like a movie. Adventure games of recent years tend to get the first bit right, and you'll find some wonderful stories lurking inside most adventure games on the market. But interactivity is usually too minimal, clunky, or just boring.

One of those games that did get it right was *The Longest Journey*, released in 2000. The story was original, interesting, and although the gameplay was traditional adventure game fare, it threaded neatly into the plot. So now we have the successor, *Dreamfall*, to try and continue

that success, and looking just at the story, presentation and pacing, *Dreamfall* has it all.

It picks up where *TLJ* left off, giving you three protagonists to control as you move between our logical, rational world of Stark, and the magical world of Arcadia. The only downsides to the story are how short it is and the irritatingly inconclusive ending (hopefully we won't have to wait another

six years for the sequel). But it's not that *Dreamfall* is a particularly short tale, it's just there's so little to do. Instead of the wonderfully presented story being punctuated by some clever puzzles or gameplay, we get minimal conversations, simple puzzles, and the sorriest excuse for action sequences ever seen in an adventure game. Third-person 3D action games have been around for ten years, so it's beyond us why Funcom struggled so hard getting it right.

The story is fantastic, as long as you're prepared to sit back and watch the hours of dialog and cutscenes, and it isn't particularly difficult even if you find the atrocious action scenes as offensive as we did. If you're serious about adventure games, want to get sucked into a great story, or just want something light to while away the weekend, *Dreamfall* will satisfy. Otherwise, check out Quantic Dream's *Fahrenheit* for a superb adventure game instead.

“*Dreamfall* is a particularly short tale, it's just there's so little to do. Instead of the wonderfully presented story being punctuated by some clever puzzles or gameplay, we get minimal conversations, simple puzzles, and the sorriest excuse for action sequences ever seen in an adventure game.”



Developer **Funcom**
Publisher **Ubisoft**
Website www.dreamfall.com

Recommended 1.6GHz CPU; 512MB RAM; DirectX 9.0c; 6GB HDD

VERDICT

Great story, nice artwork and engaging voice acting.

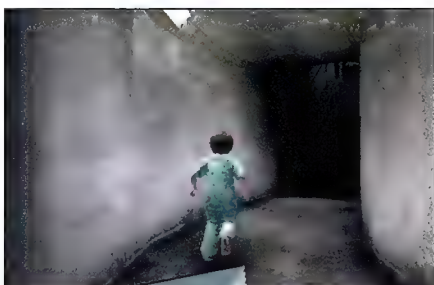


Minimal interactivity, simple puzzles, dodgy interface.



SCORE

7.0
OUT OF 10



Developer **Sony**
 Publisher **Sony**
 Website **www.forbiddensiren2.com**
 Players **1**
 Other platforms **None**

VERDICT



Atmosphere; story telling;
 facial animations;
 sight-jacking.



Character control can verge
 on the impossible; tries to do
 too much; too 'bitsy'.

SCORE
6.5
 OUT OF 10

There is a distinct lack of emergency service vehicles in *Forbidden Siren 2*.

Forbidden Siren 2

Logan Booker tempts a few sailors with his wily ways.

For millennia Capcom's *Resident Evil* and Konami's *Silent Hill* have had a stranglehold on the survival horror genre and recent attempts by others, like *Cold Fear* and *Haunting Ground*, have met only limited success despite their fresh approaches. *Forbidden Siren 2* (known as just *Siren 2* overseas) is Sony's attempt to slither into the hearts of RE and SH fans and lay a few eggs of defection.

The original *Siren* was based in the restrictive locale of a small village, so it's unsurprising that the sequel's first point of action was to let a larger space – an island in fact. Called Yamijima, the landmass is home to various nasties including hungry zombie folk and extremely violent ghosts.

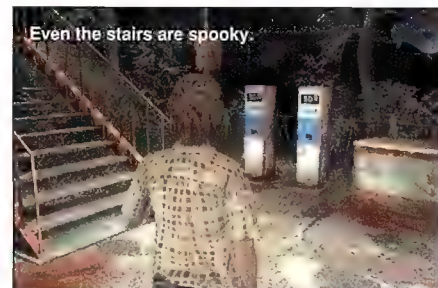
The story is greatly obfuscated and much of the game as expected is spent uncovering all the bits and pieces. What we can say is that the game follows a number of different characters that have become stranded on the island and plays out their experiences. These characters include Mamoru Itsuki, the editor of a *Fortean Times*-like magazine; Shu Mikami, a man with poor vision and a seeing-eye dog and Shigeru Fujita, a troubled police officer.

FS2's big feature is 'Sightjacking'. Using the second left shoulder button you can switch to a screen of static and, using the left analog stick 'tune-in' to the viewpoints of NPCs and enemies in the vicinity. Once a viewpoint is found, it can be bound to one of the four main buttons for recall later. Aside from the obvious strategic advantages, Sightjacking can reveal combinations to locks and other nifty things. The feature is very well done, if a little daunting, and often plays a pivotal role in gameplay.

The grainy and macabre graphics give *Forbidden Siren 2* a very *Silent Hill* feel and indeed, the game plays in a similar fashion. Fixed camera points are discarded, however, and like a third-person shooter the player gets to follow just above and behind the protagonist. Despite this, combat is still troublesome and much of the time it's hard to see exactly what's going on. This is particularly painful when playing Shu, as you spend most of your time smashing into walls via his Sightjacked seeing-eye dog.

The game is divided into timeslots and you only get to play each character for around 10-15 minutes per slot. While this sounds great in theory, the lack of a continuous viewpoint means the story comes out disjointed. Characters also seem to lose their weapons between levels, throwing any sort of consistency out the window. Playing two or three characters would have been fine, but the *sixteen* in the game is just too much to handle.

Forbidden Siren 2 is a formidable effort at cracking into the survival horror genre. But the piece-meal design, short levels and disjointed nature of the title make it hard to get into.





CivCity: Rome is the combined effort of Firefly Studios of Stronghold fame and Firaxis, the guys behind the Civilization series. We're not sure what was meant to come of this union – a city-builder with the depth of the Civ games maybe – but whatever it was it just didn't happen.

City-builders are definitely an acquired taste. There's little to no combat, nothing really explodes or dies gruesomely and the rewards, other than victory screens and event timelines, are few. The real joy comes from building a city from scratch and watching it prosper, thanks to your intelligent leadership. If you're looking for a good example of a game in the genre, look no further than SimCity.

Now, CivCity looks to have the fundamentals and the tools required to complete the magic formula. Unfortunately most of the player's time is spent guessing needs, dealing with the awful interface and trying to figure out by raw telepathy where problems are occurring and why. The graphics are also incredibly plain, but then graphics have never been a strong point of the genre.

Right off the bat, there's a lack of information sources and screens to figure out how your city is running (there's a kind of cool feature to follow individual families in the city, but it's hardly sufficient). For example, you build a carpenter's workshop to produce furniture – a luxury good that helps improve the quality and size of the

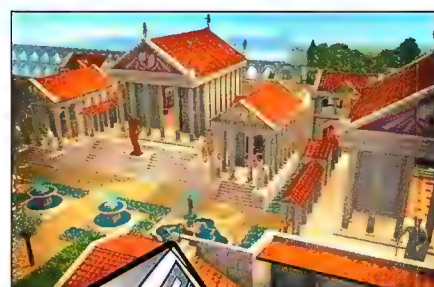
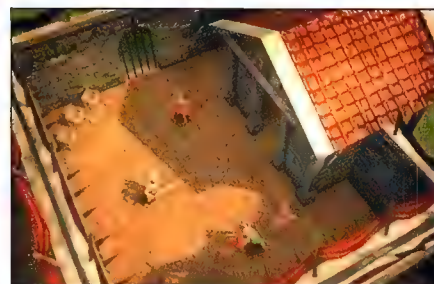
homes of your citizens. Obviously you need to build a lumberjack to start chopping wood... but how many do you need? CivCity fails to detail in any way the output or input requirements of any of its buildings, leaving you, for the most part, to be crazily inefficient as you balance the needs of your industry with the power of your workforce. One could argue that this is part of the gameplay, and in a way it is. But the whole point of city-building isn't to 'guess' these details

– it's to have them provided so you can make good infrastructure decisions based on them. This is where the main gameplay and the fun lies and it is sadly absent from CivCity.

The interface also doesn't help. For some reason building selection buttons are hidden in a mess of menus and the HUD itself is larger than it needs to be. Somewhat counter intuitively, the Escape button doesn't exit out of your current order, be it building a structure

or laying down road, and instead brings up the main menu. It's a minor gripe but one you'll find excessively annoying. Finally, the zoom out function does little actual zooming out, and even at its maximum level leaves you scrolling around even the smallest of cities.

CivCity: Rome is certainly an 'attempt' at re-invigorating the city-building genre. It's just a shame it's so mysterious to play and the interface is impossible to use.



Developer Firefly Studios
 Publisher Take 2 Interactive
 Website www.fireflyworlds.com/ccr_index.php
 Recommended 1.4GHz CPU; 512MB RAM; 128MB DX9 video card.

VERDICT

Ability to follow individual families; city-building?

Clunky, invasive interface; constant maintaining; average graphics; not enough information sources.

SCORE

6.0 OUT OF 10



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**ATOMIC'S GUIDE TO THE COMMUNITY.
READ, WRITE AND CONTRIBUTE!**

Atomix Live is on again! For some of you, those five little words are enough. Like the late Big Kev, you're excited and as giggly as a Japanese schoolgirl. Giggly like Logan will no doubt be when the fourth season of *The OC* airs next year. While the exact date of the event hasn't been confirmed yet, I can tell you that it will be in Sydney.

But some of you will be wondering what the hell I'm talking about, so let me explain. Last year, the wonderful people at Haymarket put together an exhibition called *Atomic Live*. It was a celebration of all the things you see in a typical issue all compressed into a couple of buildings in Sydney's Fox Studios (now the Entertainment Quarter). There were competitions, stalls, presentations, booth babes and network games. Not only that, but it was the first time the general public in this country could get their hands on an Xbox 360. Was it *Atomic*? Yes sir, it was very *Atomic*.

If you went last year you probably have a few suggestions and ideas for *Atomic Live 2006* – that's great. So much so that Ben has posted a thread for you: www.atomicmpc.com.au/forums.asp?s=1&c=5&t=1570.

As some of you may know, I helped out with the LAN last year, meaning I was lucky enough to get a behind the scenes look at how everything came together.

I posted a thread about it shortly after I got home (www.atomicmpc.com.au/forums.asp?s=1&c=1&t=76626). As you'll see (or read, if you check out the thread) it was not only a trial to set up our part of the event, but to get there as well!

We can already smell the beginnings of another *Atomic Live*, and you can be sure that Haymarket and *Atomic* is gearing up to put together an awesome new show. We're not sure how they'll top last year – it had everything except a squadron of flying ninja monkey robots – but rumour has it both a date and a venue have been set in stone, or set in whatever material passes as paper these days. So start getting excited now, because by the time you're totally excited, *Atomic Live 2006* will be here.

In the meantime, continue to read these fantastic pages. Yes, fantastic. It's the only way you'll be fully prepared for the terrific event that's destined to happen in the near future, where hardware, games and tech will be celebrated in a giant orgy of geekdom. We're not 100 percent sure what an orgy of geekdom would look like, but it will happen.

Just you wait.

Chris knows best.
interactive@atomicmpc.com.au



this month



Culture Shock

Ghost in the Shell, Akira, Neon Genesis...
It's anime time and we're giving away goodies!



Input Output

Dan Rutter plugs in and gets excited by answering you curly questions.



Competitions

Portable hard drives, USB flash with knives attached... We've got it, you can have it.



Avatar

We get **donnaGEM** to share wise words on juggling geekdom and nappies.



Websight

Ever woken up to a lawn of forks? You can be sure someone in the *Atomic* community has.



Fallout

Butch Cassidy, Titanic, Old Yeller...
Logan Booker adds his own happy ending.

Research.

Decide.

Buy.



shop atomic

www.atomicmpc.com.au/shopatomic

You've read about the latest and greatest kit. You've compared, and decided what you want. Now you want the best price. **Shop Atomic** searches all the top retailers in the country to find that price for you. Never leave the comfort of one site. You know it makes sense.

CULTURE SHOCK: ANIME SPECIAL

T rue geeks are all over anime. You know, those wonderfully weird and entertaining cartoons made by talented Japanese animation studios. *Akira*, *Neon Genesis*, *Princess Mononoke* and many more great films and shows have sprung from this genre, influencing directors, producers and writers the world over. For example, *The Matrix* borrows many themes from the hit 1995 anime *Ghost in the Shell*. How so? You'll have to watch it!

If you're new to anime, then there's no better place to get started than here. *Atomic*, for this issue, has embraced anime in all its forms and, with a bit of help from Madman, we have a crazy amount of classic anime DVDs to give away.

As an extension to this guide, we have a number of clips for the shows mentioned here available on the *Atomic* website. Just visit www.atomicmpc.com.au/anime.asp and get entertained!



ANIME ESSENTIALS

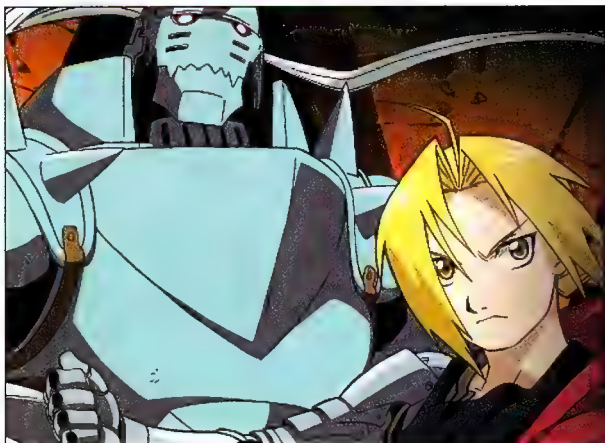
1995/2004

GHOST IN THE SHELL 1 & 2

Ghost in the Shell, at least in part, served as an influence for the Wachowski brother's *The Matrix*. Indeed, the concepts of reality and perception are tackled head on in this adaptation of Shirow Masamune's famous manga. Director Mamoru Oshii turned the content into the perfect thriller, using the character of Motoko Kusanagi, a cyborg with a soul, to explore the conflict between machine and human and the inevitable victor.

The sequel follows Kusanagi's partner, Batou, as he attempts to solve a crime involving out-of-control geisha androids that murder their masters. It looks at many of the themes of the first film, but does so at a slower pace – *GITS 2* tends to meander more, and an interesting feel is achieved through the use of CG. The *GITS* series is definitely for fans of philosophical entertainment.





ANIMEESSENTIALS

2004

FULLMETAL ALCHEMIST: VOL 1

No anime collection would be complete without a recent addition, and to top off our essential anime pack we've included the first volume of the highly successful *Full Metal Alchemist*. Weighing in at 51 episodes and one film, *FMA* took a firm grasp of anime fans both in Japan and overseas and even after the series' completion, has yet to let go. *FMA* serves as a milestone in anime.

Heavily influenced by the ancient art of alchemy (as one would guess) *FMA* features two brothers, Edward and Alphonse Elric. After a childhood accident that took Edward's arm and leg and almost claimed Alphonse's life, Edward is left partially mechanical and Alphonse's soul bound to a suit of metal armour. Edward works as a State Alchemist and the series follows the pair's travels through animation studio Bones' quasi-magical/scientific alternate reality.



ANIMEESSENTIALS

1988

AKIRA

Anyone looking to get involved with anime cannot go past Katsuhiro Otomo's *Akira*, based on Otomo's comic (or manga) of the same name. *Akira* is not a true conversion of the manga to film, instead taking the characters and history to tell a new story.

Akira had a huge impact on the popularity of anime and the genre has never been the same. Considered by aficionados as the anime that started it all – in the West at least – *Akira* has all the trademarks of the genre. There's the suave protagonist – the motorcycle gang leader Shotaro Kaneda – the dystopian setting of Tokyo rebuilt after nuclear war, the social commentary, the military element and the bizarre high fantasy influences. From its humble start to massive climatic finish, *Akira* is a joy to behold.



ANIMEESSENTIALS

1995

NEON GENESIS EVANGELION: VOLUME 1

Neon Genesis Evangelion was the catalyst for the widespread popularity of the mecha genre of anime in the West. Comprised of just 26 episodes and two movies, it still managed to make a huge impact on mature anime fans. Director Hideaki Anno and studios Gainax, IG and Tatsunoko struck gold.

A young boy, Shinji Ikari, stars as the pilot of a giant robot (an Evangelion, or Eva), defending humanity against alien invaders (Angels). Rei Ayanami is a child pilot with a mysterious, bleak past and Shinji's father Gendo Ikari controls NERV, the organisation that developed the Evas. The show revolves around the mental states of the young pilots and of the awkward relationship between Shinji and Rei. Many contemporary anime series are based on the concepts introduced in *Neon Genesis*.



ANIMEESSENTIALS

1997

PRINCESS MONONOKE

Masterful. One of those rare anime to have an all-star cast for the English dub, including Gillian Anderson and Billy Bob Thornton, *Princess Mononoke* rates as one of Studio Ghibli's and director Hayao Miyazaki's greatest achievements, second only to Miyazaki's *Spirited Away*. This powerful and visually awesome film follows the story of Ashitaka, a diseased prince searching for a cure. The affliction grants him superior strength and vitality, but eats away his life. His only hope rests with Mononoke, a girl of the forest raised by wolves. In the mix is the industrious entrepreneur Eboshi – whose only desire is to farm the natural wealth of the forests in which Mononoke lives – and the lively characters under her command.

If you're after an anime that has it all (except mechas) then go no further than *Princess Mononoke*.



PARANOIA AGENT COMPLETE COLLECTION

DIRECTOR SATOSHI KON
STUDIO MADHOUSE
WEBSITE WWW.MADMAN.COM.AU
DISTRIBUTOR MADMAN RRP \$79.95

Satoshi Kon's *Paranoia Agent* is one of the most messed-up anime series you could ever watch, blending popular culture, political activism and insanity to create the sort of amazing production Kon is famous for.

The *Paranoia Agent* series indirectly follows the story of toy designer Tsukiko Sagi, creator of the extremely popular Maromi – a small, pink dog with a giant head and massive eyes. Sagi is unassuming and almost childlike, but is aware of the contempt of co-workers, jealous of her sudden fame. With the pressure to come up with a design as fantastic as Maromi, Sagi finds herself on the verge of a breakdown.

The first episode *Enter Lil' Slugger*, sees Sagi attacked by a mysterious assailant as she travels home. When two detectives question her about the attack, she can provide only a silhouetted drawing of what looks like a school boy wearing a cap, skates and a broken bat. Attacks by 'Lil' Slugger' escalate in both number and ferocity.

For the next few episodes Kon slowly feeds the viewer pieces of the Lil' Slugger story. The viewer sees the activities of his next victim in the lead up to their assault.

Kon uses many devices to convey his strong views on society – from the subtle use of Maromi to reflect rampant consumerism, to the more obvious use of main characters, like Yuichi Taira in the second episode, to explore bullying and peer pressure in school.

The animation is excellent and the soundtrack (from OctaMED-crazy Susumu Hirasawa) really drives the emotion home.

SCORE **9.0**
OUT OF 10

WIN 1 BOX SET OF PARANOIA AGENT! WORTH \$79.95

Thanks to Madman, we have the complete series of *Paranoia Agent* to give away. Get clicking to www.atomicmpc.com.au/anime.asp and answer the following to be in the draw.

Q: What two golden items are associated with Lil' Slugger?



EUREKA SEVEN VOLUME ONE

DIRECTOR TOMOKI KYODA
STUDIO BONES
WEBSITE WWW.MADMAN.COM.AU
DISTRIBUTOR MADMAN RRP \$29.95

Eureka (pronounced 'you-wreck-a') *Seven* doesn't wait a moment to draw you in with irresistible force. This strong appeal is a testament to both director Tomoki Kyoda and Bones, the studio behind *Full Metal Alchemist*.

Young protagonist Renton Thurston dreams of becoming a 'lifter' – surfer of air currents – and you can't help but keep watching to find out how poor Renton fairs in his travels.

His life is far from grandiose – with below average grades and short attention span, Renton's only practical future is to follow in the footsteps of his grandfather and become a mechanic. However, Renton dreams of lifting. His idol, Holland, is the leader of the lifting crew Gekko State and it is Renton's ultimate goal to perform a difficult lifting move only Holland can do. Except Gekko State doesn't perform its moves in the flesh, instead using giant mechanised LFOs (Light Finding Operation). Through a twist of fate, Renton finally meets Holland and his dreams come true – sort of.

It's mecha anime and there's nothing terribly new on that front. But the concept of surfing air currents on transparent particles, or 'Trapars' is refreshing and the characters, while your usual anime assortment, feature enough flavour to make the series a standout.

It's a little corny at times, but worth every minute. If anything lets the show down it's the mecha element – it feels tacked-on to the story to give it that cool technology edge that many anime fans crave, but in the end it does have relevance, and hey, giant robots are always good.

SCORE **8.0**
OUT OF 10

WIN 1 OF 5 EUREKA SEVEN: VOLUME 1 DVDS WORTH \$29.95

Yes, be in with a chance to win one of five of the first volumes of *Eureka Seven*. Just visit www.atomicmpc.com.au/anime.asp and answer the following:

Q: How old is Renton Thurston?



ZAION: I WISH YOU WERE HERE

DIRECTOR SEIJI MIZUSHIMA
STUDIO GONZO
WEBSITE WWW.MADMAN.COM.AU
DISTRIBUTOR MADMAN
RRP \$29.95

Zaiou: I Wish You Were Here is an anime that should never have been made – you know, in that pile with all the tentacle hentai. Ignoring the fact that the word 'Zaiou' is never mentioned, or the strap 'I Wish You Were Here' explained, *Zaiou* fails to really engage the viewer or emotionally involve them.

There's a cool concept hidden under the surface of the dodgy animation and voice work. Basically the world has been afflicted with a virus, called M34, spread from a meteor impact. It transforms those who contract it into zombie-like creatures that look like bizarre stone golems. The only force powerful enough to combat the threat is a group of nanobot-enhanced combatants. When faced with danger, the nanobots rise from their host's circulatory system and cover the skin with metal. The nanobots are also able to neutralise poisons and diseases, rendering the combatants immune to the virus. The story starts shortly before the virus mutates into a form capable of destroying the nanobots.

Let us put aside the obvious logical plot hole – why didn't they just immunise everyone with nanobots (perhaps they could have wiped it out before it mutated) – and look at *Zaiou* in its entirety. The story follows the experiences of one of the nanosoldiers, Yuji Tamiya, and his frustration with the military and their inability to fight the infection. Rumours are that the military has a secret weapon that it has yet to use, and Yuji can't understand why it's holding back.

The secret weapon, unsurprisingly, is a young girl called Ai, who has to deal with life in what is essentially captivity, a burgeoning romance with Yuji and annihilating hordes of killer rock men.

With only four episodes to its name, *Zaiou* feels more like an experiment with a concept, rather than a properly executed series. The story just seems too disjointed and poorly thought out, leading to a barely comprehensible anime.

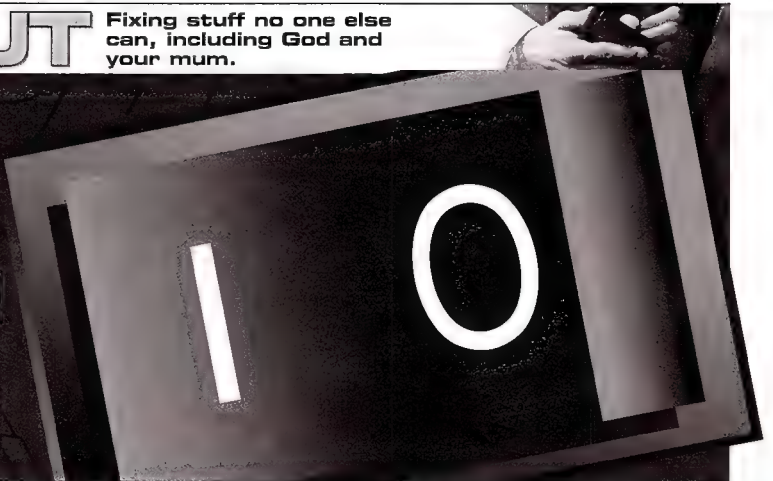
SCORE **5.5**
OUT OF 10

INPUT OUTPUT

Fixing stuff no one else can, including God and your mum.

Wham, bam, Dan!

Dan Rutter has nothing to do. Send him something technical and broken to fix at io@atomicmpc.com.au.



She's gonna be a bastard to start...

I I have a computer at work (in a factory environment) that has been giving me trouble ever since the really cold weather started (in Melbourne).

It runs XP Home. I have ghosted back to old copies, before major Windows updates and other changes, and it does the same thing. It takes four to five minutes to boot compared to its usual two minutes. Sometimes a boot ends in a BSOD. Sometimes Windows won't load various files. Sometimes it can't see where the previous Windows install is. WTF?!

When it boots it does everything super slow. Defrag will not start and Scandisk (on reboot) comes up with 'unreadable sector' problems.

Give it half an hour after startup and its up and running full speed. No disk errors on any scans.

This has me really confused, as it's never had any issues for the last three years. Any suggestions on a fix would be much appreciated.

George

O Sounds like a classic 'stiction' problem to me. One or both of the hard drive's two moving assemblies (the platters and the heads) are having a hard time moving until it's warmed up, for one reason or another (bearings, gooey lubricant, a weak spindle motor...). If the platters are hard to spin, the drive may periodically be falling below its normal rotational speed and putting operations on hold while it spins back up and stabilises its speed. If the heads aren't responding to the voice coil quickly or accurately enough you can get all sorts of freaky errors, or at least really crappy drive performance.

Stiction problems (it's a real, though colloquial, physics term: en.wikipedia.org/wiki/Stiction) aren't nearly as common as they used to be (particularly back in the days when he who didn't run the special head parking program before shutting the computer down would hear an expensive noise when he flipped the switch). But they can still happen.

Possible solutions, in increasing order of practicality:

- 1 Open up the drive in a very clean place, and very carefully oil the bearings.
- 2 Treat your computer like the Land Rover in *The Gods Must Be Crazy*, and just never let it stop.
- 3 Get a new drive.

Also, flushing the toilet opens the garage door

I When I turn my bathroom light on or off, it makes the USB gamepad in my living room malfunction, needing an unplug-and-replug. This is 100 percent reproducible.

The light and the computer are obviously on different circuits. The only interesting thing about the light is that it is one of those 1980s light-fan-heat combos.

How can this happen?

Bennett

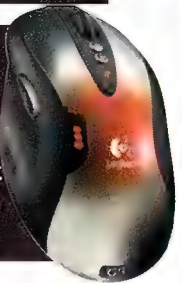
O It's probably RF noise from the light switch – but there shouldn't be enough of it to cause that glitch.

Step one: Get a table lamp or a vacuum cleaner or a toaster or something, sit it close to the gamepad, and turn it on and off. If that causes the same problem, then broad spectrum RFI is indeed the cause.

You can detect this interference, though not of course tell what's susceptible to it, by using an AM radio tuned to no channel in particular. You'll

IOOTM wins a Logitech G5!

The ultimate in mouse technology. It's fast, slick and better than anything at the local milk bar.



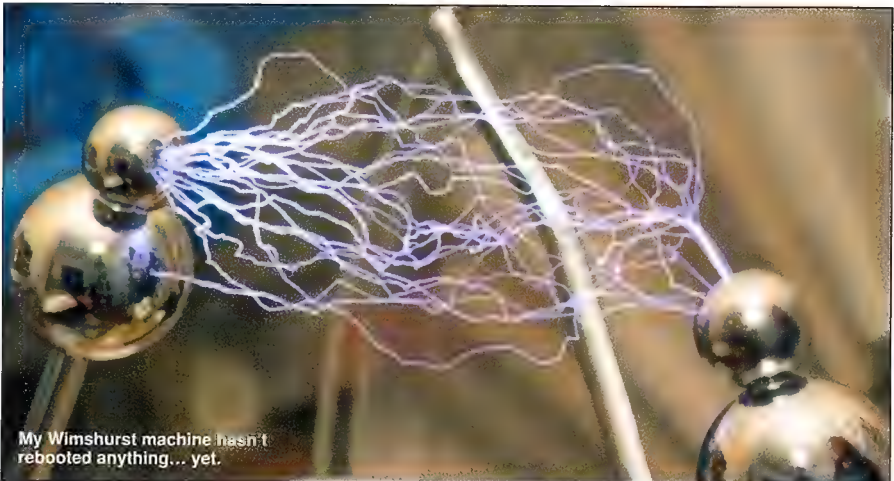
hear pops and crackles whenever something sparks nearby.

A light switch that produces *lots* of RFI is a light switch that's arcing a lot more than it should. That's either because it's striking one relatively long-lived arc as it switches, or, because it's bouncing a lot when you switch it, striking lots of short-lived arcs. That's more likely. This can go on for years with no problems, or it can start a fire the next time you have a shower.

If the switch is as old as the combo-lamp thing, it could very easily be a mess in there. Fortunately, it's no big deal to wire in a new one.

It is, of course, *illegal* in numerous countries to do this job yourself if you're not qualified, and it's *dumb* to do it if you don't know what you're doing. There are also more wires involved in a multi-switch plate for heat, fan and light than there are in a normal light switch, so it's much easier for a novice to screw up.

You have been warned.



But I only download porn, officer!

I A workmate of mine is being accused by his ISP of illegally downloading SWAT 4. It has served him with a notice and is not responding to his requests to show proof (on this charge he is actually innocent, he doesn't bother with downloading games). However he has 10 working days in which to prove his innocence, and with the ISP ignoring him it's hard for him to proceed.

Going through www.tio.com.au will likely take longer (and the Ombudsman usually won't touch anything until there have been various avenues of resolution followed), so I've told him to make a post on the Whirlpool forums as well.

Have you got any ideas on what he can do to proceed or get a response from the ISP?

Steve

O I don't know much about this, but Electronic Frontiers Australia (www.efa.org.au) probably does.

It doesn't give legal advice, but that's not really what you're after here, and it's not a good source of references to other people. Get your

friend to phone the EFA, rather than email.

Note that the agreement that everybody ignores when they sign up with their ISP invariably includes clauses that allow them to cut you off for any reason they like, and actually taking something like this to court is pointless unless the ISP (or the media anti-piracy protection racket of your choice) is making you go there itself, or threatening you with something worse than losing your Internet connection.

That, of course, is no reason to not be angry with the ISP and do your darndest to make it famous on Slashdot for the week.

Holy water usually makes things worse

I Now my wife hates me even more. Usually she only uses the Dell for Mahjong but its non-availability, due to my error, is a major issue. I moved (only a tiny bit!) the computer, and now the LCD screen is black. Tried on-off and new-video-cable and analog-cable-instead and look-inside-to-see-if-the-video-card-has-shifted things, all to no avail.

How can you troubleshoot a PC with no screen?

Help me, Obi-Dan Kenobi, you are my only hope...

David

O I don't have a definite answer for you, but I can give you some more pointers. Does the machine beep once, as usual, on startup? If so, then it's passing its Power-On Self-Test (POST). If there's a fundamental hardware problem then you'll get a beep pattern on startup, or no beep at all.

Do you have another monitor, or another computer on which to try the Dell monitor? My best guess at the moment – which is just a guess – is that the Dell monitor just chose that moment to drop dead. Modern monitors let you access their On-Screen Display even if there's nothing plugged into them – and they usually have their own special nothing-plugged-in notification as well – so you can do some basic troubleshooting that way, too.

(David got back to me. The problem was a diabolical combination of a dodgy cable and a dodgy video card. Replacing both components cured it.)

I/O OF THE MONTH

IRQL Equality Now!

I I recently got Need for Speed Underground 2 for my computer, and every time I get to the main menu it comes up with an error and restarts. At the top of the error it says DRIVER_IRQL_NOT_LESS_OR_EQUAL. What's wrong with my computer?

Samuel

O Congratulations – you are enjoying what may be the *definitive* Mystifying Bluescreen Error.

Different Windows versions can come up with a plethora of inscrutable stop errors, of course, but the Not-Less-Or-Equal one has the distinction of both making no obvious sense at all (even grammatically), and being quite common.

To be fair, the name's slightly informative, as is the rest of the stuff on the error screen if you've been struggling with these things long enough that your eyes naturally dart down to the lines that start with asterisks.

This failure can, as the name says, indeed be caused by various low-level chicanery that actually has to do with the Interrupt ReQuest Level (IRQL) settings for hardware. Usually, it's actually the drivers that connect the hardware to Windows that are at fault, which is good because it means you can upgrade the drivers to fix the problem – or disable the offending hardware altogether, while leaving it plugged into your computer.

The asterisk-lines in the screen shot that you attached show that nv4_mini.sys is what Windows thinks caused the problem this

time. As the name suggests, that file is part of the NVIDIA driver suite, so the first step in your bug-hunt should be upgrading your graphics card drivers, if they're not already the current version.

This is step one in all of the useless troubleshooting guides on games companies' websites, but there's a reason for that. If Windows explodes every time you run a game, then the graphics card reaching for a previously unused piece of its driver may indeed have something to do with it, even if some graphics-driver-y file *isn't* named on the error screen.

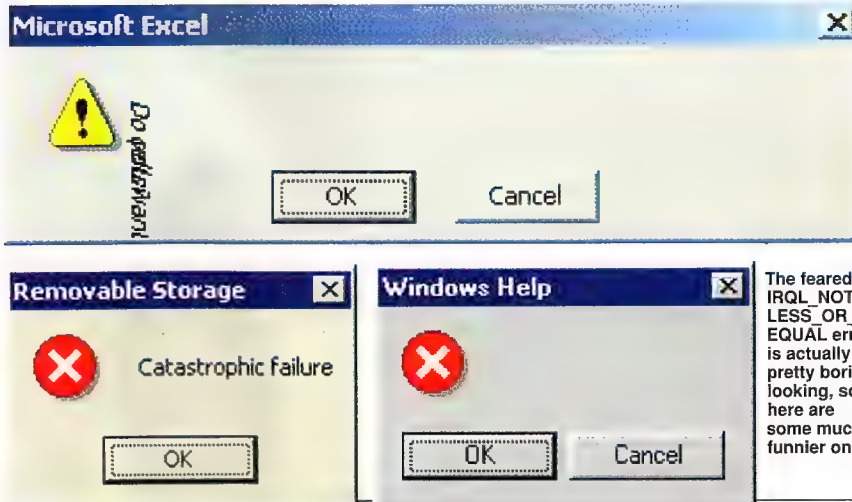
If this doesn't help, feel free to upgrade any other drivers you can think of. Any driver could be the culprit. On some motherboards, for instance, USB controllers that aren't even connected to any devices can cause this problem. Disabling the offending hardware in Device Manager will unload

the driver and fix things, so you could go on a rampage through Device Manager disabling anything you don't actually need to run the game (including stuff you need to connect to the Internet). If that helps, you can start re-enabling things until the problem comes back.

However, drivers aren't the only possible cause. Non-driver software conflicts of one kind or another can do it, as well. Anti-virus software, for instance.

As you're having the problem instantly and consistently at one definite time, it's probably not a gross hardware problem. Not-Less-Or-Equals all over the place are often caused by bad RAM, and you should *never* rule out the possibility of a bad power supply when a PC goes weird.

In your case, though, it's probably drivers.



The Win Bin

To enter, go to www.atomicmpc.com.au/competitions. You can only enter once per competition or you'll be disqualified. You must provide a postal address and phone number for prize delivery when you enter (not a PO Box).

3x 4GB Iomega Micro Mini USB hard drives

The popularity of portable hard drives is on the rise, and Iomega is here to make sure you're not left out. We have three tiny 4GB Micro Mini hard drives to give away and boy, are these babies great. They light, fit in any sort of pocket you might have, and can store 4GB of data. Cheers to Iomega (www.iomega.com) for supplying these.

Q What is the name of the innermost Galilean moon of Jupiter?

5x 512MB Flexiglow Multi-Tool Flash Drives

Even been stuck with a pocket knife, but no USB key? How about the other way round? If either scenario sounds familiar, or you just like pocket knives and USB keys, check out the Flexiglow Multi-Tool. Along with an assortment of cool tools, this glowing gem has a 512MB USB flash drive in which to store all your data. Thanks to Flexiglow (www.flexiglow.com.au) for these great prizes, valued at \$69 each!

Q A diamond-based LED would emit what type of light?

1x 750W Thermaltake Toughpower PSU

Power to the people – well, to anyone who snags this great PSU from Thermaltake. It comes with pretty much everything you'd expect in a top-class unit, including 750 watts of raw power to keep your system running like a happy cat in a field of flowers. Cheers Thermaltake (www.thermaltake.com) for letting us give one away!

Q James Watt helped develop what type of engine?

To enter visit www.atomicmpc.com.au/competitions. The closing date for entries is 13 September 2006. Winners will be announced in *Atomic 70*.

Atomic 66 winners: 1x Thermaltake Eureka case Q: In which year did the Eureka Stockade occur in Victoria, Australia? A: 1854. R. Savazian, Matraville NSW. Q: What is the name of the developer of the original Heroes of Might and Magic? A: New World Computing. R. Thelian, Fairfield Heights NSW; R. Gillespie, Ravenshoe QLD; K. Auer, Cranbourne VIC; Y. Lee, Eight Mile Plains QLD; S. van Vugt, Aberfoyle Park SA. Q: Which Australian player captained the Socceroos in the side's last World Cup Finals campaign in 1974? A: Peter Wilson. S. Mariage, Ballina NSW; K. Lay, Stratford VIC; B. Jacobson, St Ives NSW; M. Siemer, Oxley QLD; B. Andrews, Mt Barker SA. 1x Volumes 1, 2 & 3 of *Tintin*. Q: Beginning with 'M', what is the name of the hall in which Captain Haddock resides? A: Marlinspike. K. Maskell, Katherine NT.

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atomic

editorial editorial@atomicmpc.com.au
editor logan booker
technical writer craig simms
sub editor richard cann
online producer ben mansill
editorial director debra taylor
managing editor david kidd

design design@atomicmpc.com.au
art director bill chan
product photography jason busch

contributors

ben mansill, tim dean, daniel rutter,
ashton mills, kate inabinet, leigh dyer,
james wang, ron prouse, christopher
taylor, nathan davis, moz, hulks

production

production manager kris harrison
production co-ordinator matt dykzeul
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(02) 9282 8777
gordon & gotch new zealand
(09) 625 3005

advertising + marketing

t+61 2 8399 3611 f+61 2 8399 3622
advertising manager
louise vicente
lvicente@atomicmpc.com.au
marketing & promotions neil parkin
nparkin@haymarketmedia.com.au
account executive kate phelan
kphelan@haymarketmedia.com.au

haymarket media

t+61 2 8399 3611 f+61 2 8399 3622
52 victoria street, mcmahons point
nsw 2060 australia
managing director jeremy vaughan
associate publishers jon westredge
john massey

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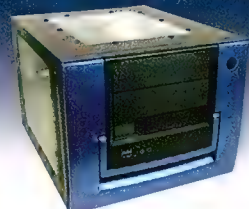
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AVATAR

Atomicans!
Tell us who
you are!



donnaGEM

Atomic's smoochie mommy talks to Ben Mansill about babies, hubby Zeph, the Alpha Geek, newborn baby Liam and the joys of tech.

Little Liam Warren Seen was born at 8am on Saturday, 15 July 2006 after a fast and furious labour. He's now enjoying plenty of cuddles in the wee hours of the morning in the green glow of the *Atomic* forums with a very tired but ecstatic mummyGEM and Daddy Zeph.

System specs: Weight: 4.035kg/8lb 14oz;
Length: 52cm; Core temperature: 37°C (idle);
Noise: 25dB (idle), 110 dB (full load).

atomic You are a teacher and have just given birth to your second child – what is it about children that you love?

donnaGEM Children are life. They inspire me, motivate me, entertain me and challenge me. I love that I have the capacity to teach children – to help them grow and develop. But at the same time they can teach me about life and living.

I'm actually struggling to find words powerful enough to describe how important my connection with children is to my life – they move me from one day to the next.

atomic Your husband (codename Zephyr) is a mega geek – what's it like being married to a techhead of the highest order?

donnaGEM I love it. I never would have thought

I'd ever have any connections to geeks of this magnitude in my life but now that I've snagged one I could never imagine living a life without my sensitive, intelligent geek husband, and when my computer breaks or I need more power for my machines, he's just a whinge away.

atomic Are you a geek chick?

donnaGEM I try! I definitely get the twitches if I'm away or out of reach of a computer for too long. I love my Internet, I love my games (usually strategy and sim style games), and I just love what computing technology can offer my life.

atomic Is your home a showcase of integrated lifestyle technology?

donnaGEM I'm sitting in our study at home with (looks around)

five regularly operating computers and I wouldn't know how many boxes and servers are hanging around the house. We're currently building our dream home at the moment and Zeph's down at the house for the third day in a row supervising things and ensuring the house is filled with every type of cable imaginable. LAN sockets in the kitchen? Gigabit in the nursery? Why not! Keyless entry from the garage? May as well!



atomic How did you first find the *Atomic* forums?

donnaGEM I became entranced in those quiet moments when I'd sneak up to give Zeph a cuddle and find him glued to the black and green screen YET again. Finally a friend (another geek girlfriend) infiltrated *Atomic* and asked me for back up support, so I posted and then I posted some more, and read a bit more and kept posting and what do you know, four years later I'm still there. In fact, these days Zeph's more likely to see the black and green over my shoulder.

atomic What do you most love about the *Atomic* community?

donnaGEM Diversity. When I first experienced the forums I expected to feel clueless and un-geekworthy. Instead I was confronted with such a wide range of personalities and so many different levels of geekdom that it was easy to slip into the midst. I've travelled the country to meet many different *Atomic*ans and have made some of the best friends I've ever had. I've found friends to chat to, to seek help with computers and my teaching and general aspects of my life, to laugh with and many of whom I've been able to help through some tough times. When I'm with *Atomic*, I'm a unique part of a diverse community, as every individual is there, regardless of their computing capabilities.

atomic What advice would you give someone that may have always wanted to join the forums, but has never gotten around to it?

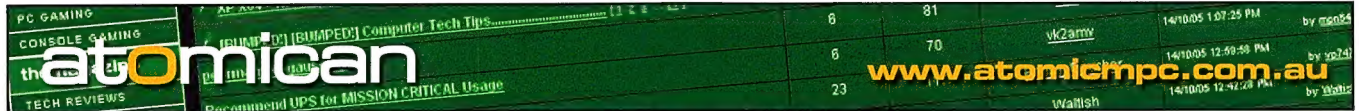
donnaGEM Hard core geek or not, you WILL find something on *Atomic* to amuse and entertain. You take from the forums what you want and leave the rest but you will always get more than you give.

atomic Puppies or kittens?

donnaGEM Kittens without a doubt. I'd be lost without my kitties! Our cats became regular little nursemaids in the lead up to my labour. They follow me around, sit by my side while I'm tired or sick, snuggle around my belly when I'm relaxing. I think they'll make great big sisters for bubby.

WEBSIGHT

A hands-on look
at the awesome
Atomic community



Moz Hey Hulkster. How has the month treated you?

Hulkster Mate, ease up on the Hulkster bit. From now on I want to be called 'Studmuffin' or 'Studley Dudley'. You know, a real macho name, just like this lot here.

www.atomicmpc.com.au/forums.asp?s=1&c=1&t=88814&p=0

Moz After seeing your reaction to donnaGEM's detailed commentary on the birth of little Liam, I'm wondering if 'The Incredible Hulk' might suit you better. I've never seen anyone turn that shade of green before!

www.atomicmpc.com.au/forums.asp?s=1&c=1&t=89634

Hulkster It wasn't just that. Poor Hypergumby was having troubles with his tail end and just had to tell us all about his poo problems. I could have done without it.

www.atomicmpc.com.au/forums.asp?s=1&c=1&t=88909

Moz Bring back some bad memories, huh?

Hulkster Yeah – of trying to house train you. At least the lawn was always safe, unlike orinjuce's. Someone vandalised his front yard in a most appalling way.

www.atomicmpc.com.au/forums.asp?s=1&c=1&t=89672

Moz Forking hell! Maybe the perpetrators were just looking for fish bait? Moving right along, TazFromOz has been trying to work out how the online community would fare in the real world by compiling a list of people and their skills, whatever they may be.

www.atomicmpc.com.au/forums.asp?s=1&c=1&t=89522

Hulkster The position of 'Village Idiot' is still free I hear. You have time to apply, mate. Or perhaps 'Clown' would be more your style. Just don't go anywhere near Chuck Norris (good actor) when you are wearing your clown makeup. He obviously has some issues with them and can't see the funny side.

www.atomicmpc.com.au/forums.asp?s=1&c=1&t=88574

Moz I don't think I'd make a good clown. I used to think I would be a good detective though. That is, until Lambo published *The Atomic Code*. Try as I might, I couldn't get past the first clue. It didn't stop the resident sleuths from solving the intriguing puzzles that were posted!

www.atomicmpc.com.au/forums.asp?s=1&c=1&t=88117

Hulkster You'll get there mate, don't worry. Why, just the other day you worked out how to open a box of cornflakes without using the hedge clippers! Moving right along, MacDude is having another anime night at his place. I heard the last one was great till someone swapped the DVD for one of Macca's 'home movies'. I didn't realize he could get his legs over his head like that. Must have hurt.

www.atomicmpc.com.au/forums.asp?s=1&c=5&t=1622

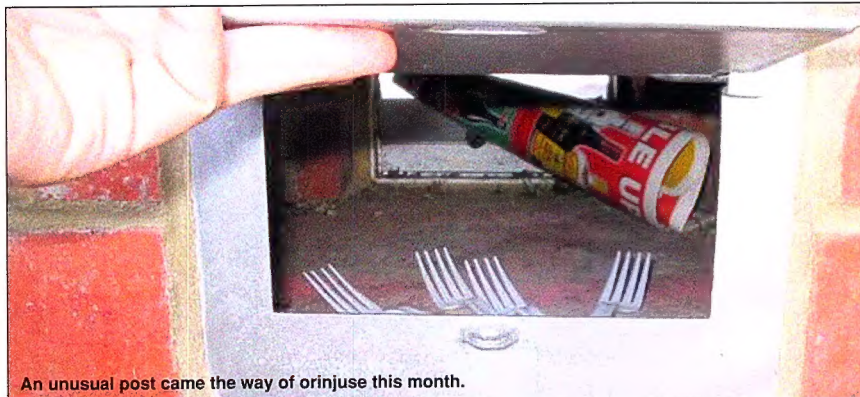
Moz Pity your parents didn't think about safe sex around the time you were conceived. This thread from thatp1g may have done them some good and saved us all a lot of misery.

www.atomicmpc.com.au/forums.asp?s=1&c=1&t=88749

Hulkster Here are some people who won't cause you any misery – *Atomic Heroes*! The latest batch of the best of the best has just been announced. Congrats to all the recipients!

www.atomicmpc.com.au/forums.asp?s=1&c=1&t=89678

Moz If you would like to meet them and all the other wonderful people here, get yourself online and join the *Atomic* forums!



An unusual post came the way of orinjuce this month.

POST OF THE MONTH

Sometimes posts are simple stories. Other times they are recounts of amazing experiences. Often they are public causes to help someone. Rarely though, are they brilliantly contrived multi-layered puzzles that take the community on a ride through the *Atomic* site,

challenging our wits and knowledge.

Da Atomic Code

www.atomicmpc.com.au/forums.asp?s=1&c=1&t=88117

is POTM 68. Lambo thrilled us all with a perfectly crafted puzzle game, having us dash off

to various parts of the forums, racing for the next clue. It was written in a perfect Da Vinci style, and rallied the participants who all had a hoot with it over several days. Thanks for making it happen Lambo, enjoy your new Logitech G5!

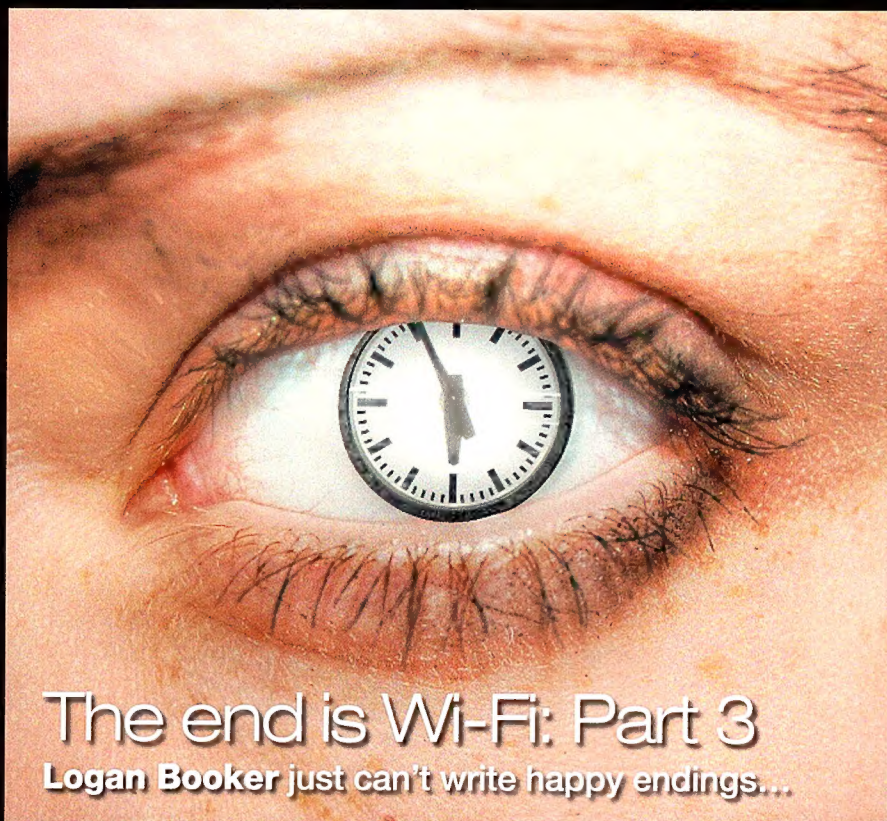


Every **Post of the Month** wins a fabulous **Logitech** mouse from the brilliant people at **Logitech**... Huzzah!

FALLOUT

Funnies and
humour from the
fallout zone

FALLOUT



The end is Wi-Fi: Part 3

Logan Booker just can't write happy endings...

Dee could no longer run. Not that she was running now, more falling to the ground. Her body hit the cracked earth with an unremarkable thud and her foil hat tumbled from its perch on her scalp.

Minutes passed as she lay there, stunned and defeated. There was no chance she could make it to the bunker now. All she could do was accept her fate.

'Time to die.' She closed her eyes.

'Not yet.' A voice.

Dee opened her eyes. She recognised Wil's hunched form peering over her.

'Get up,' he said.

She hadn't exactly stood – all she could manage was to sit up. Wil was crouched beside her. The bunker was nowhere in sight – they were in the middle of the desert, with beams of death flying willy-nilly above them.

It was then she realised the hum was gone.

'Yes, it's gone. But it'll be back.'

What, he was reading her mind now? 'I don't understand Wil.'

Wil smiled. 'How could you?' Except it wasn't a happy smile. In fact, it was the grin of someone on the brink of insanity, or more accurately, someone caught by the seat of their pants on an outcrop on the brink of insanity.

'It just stops. Everything just stops... and then I remember everything that happens.'

He tried to run his hand through his tangled mane, but his aluminium hat deflected his attempt. Dee put her hand on his shoulder.

'Are you okay Wil?'

He turned his head away. What he said next made her want to vomit.

'Don't know Dee – if you had to watch me die a 1000 times, how would you feel?'

It made no sense.

'Do you believe in Heaven and Hell, Dee?'

'Wil, we need to get back...'

He grabbed her by the arms and shook her.

'Just answer the damn question!'

'Uh... no. I like to think there's something, but, um, I don't believe it's God necessarily.'

Wil groaned. 'That's not what I asked. Let me put it this way... what would you say if I told you a place existed where you're forced to watch someone close to you die over and over?'

'I'd have to say it would suck.'

'Yes, yes it would.'

Silence prevailed for a few moments. Just long enough for the conversation to sink in.

'How many times have I died, Wil?'

He stared directly at her. His glare could not have been colder.

'I have no idea. All I know is that you're about to die. Again.'

Dee was shivering. Inside her mind, hysteria was beating the living crap out of rational thought with a shovel.

'I like to think I'm paying for some terrible evil. The fact I'll never eat yoghurt or roast chicken again was a nice sadistic touch.' Wil buried his head in his hands. 'For some reason it stops at this point, right after you trip. But only for a few minutes.'

'Then... I die?'

Wil nodded.

'So who am I?' Dee could feel her reality falling apart. 'I... I don't get it. If this is your Hell, then is it mine too?'

'I guess.' Wil seemed to contemplate the question. 'All this time, I've never thought about that. I just assumed you were just another element to my torture.'

'I can assure you that I'm not.'

Wil laughed.

'What does it matter anyway? You're still going to die!' Wil spat the sentence. Dee ignored him, her mind burning adrenaline.

She refused to die.

What happened before they left the bunker for the jammer? No, she had to go back further. Before the hats, before she made the aluminium hats to... protect them?

“His glare could not have been colder. ‘All I know is that you’re about to die. Again.’”

It was then she noticed Wil was still wearing his. Hers had vanished.

She refused to die.

Wil didn't react when she snatched his foil cap and planted it on her head. In fact, she swore he looked peaceful. Serene.

Seconds later, his head exploded.

Then everything went black.

Dee took off her aluminium hat. 'Do I really have to wear this?'

WANT THE REST OF THE END IS WI-FI? GRIPPED LIKE SOMETHING HAS YOU GRIPPED IN SUSPENSE? THEN CHECK OUT ATOMIC 66 AND 67 FOR PARTS 1 & 2!

PowerColor



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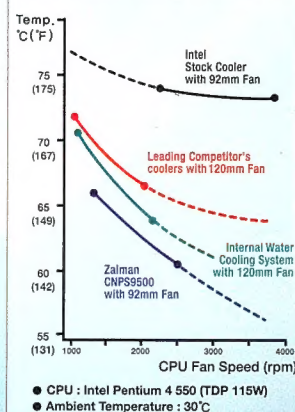
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Performance Comparison Chart



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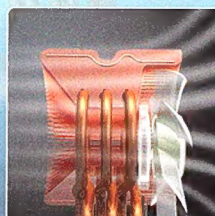


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Ultra Quiet CNPS 92mm opaque fan with blue LEDs



Aerodynamically optimized heat sink for smooth airflow and minimal noise

Specifications

Dimensions (L x W x H)	85 X 112 X 125 mm (3.35 X 4.41 X 4.92 inch)
Heatsink Material	Pure Copper Base Pure Copper Fins Pure Copper Heatpipes
Weight	498g (17.56oz)
Dissipation Area	3,498cm ² (542.19 inch ²)
Fan Size	92 X 25 mm (3.62 X 0.98 inch)
Fan Operating Voltage	5-12V
Rated Current	0.35A
Max. Power Consumption	4.2W
Bearing Type	2-Ball Bearing
Fan Speed	1,350 - 2,600rpm ±10%
Noise Level	18.0 - 27.5dB ±10%
Connector	3-Pin
Fan Speed Controller	FAN MATE 2

Minimized Weight

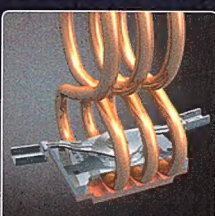


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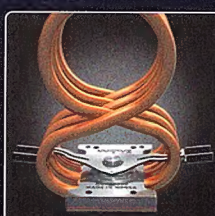


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